

**FACTORS INFLUENCING INTENTION TO ADOPT
BLOCKCHAIN TECHNOLOGY: CASE STUDY OF FINANCIAL
SERVICES IN INDONESIA**

FINAL PROJECT

**By
Nadya Aulia Vitriastuti
19016064**



**Undergraduate Program
School of Business and Management
Institut Teknologi Bandung
2019**

Factors Influencing Intention to Adopt Blockchain Technology: Case Study of Financial Services in Indonesia

Nadya Aulia Vitriastuti
19016064

Supervisor: Akbar Adhi Utama Ph.D
Undergraduate Program School of Business and Management
Institut Teknologi Bandung, 2019

ABSTRACT

Rapid growth of Digital economy in Indonesia leads to many implementation of technologies. One of the emerging technology is Blockchain. Blockchain is a feature of peer to peer distributed ledger which have no central authority allowing people to trust each other in a form of trustworthy ledger. Blockchain possesses the potential to disrupt and reshape many industries including financial service. Financial service industry is said to be the early adopter and most potential industry to adopt blockchain technology. Meanwhile, the number of Indonesia's financial service that utilize blockchain on their business is still limited. However, the real value of a technology can be realized when it is being adopted at a broader level. Thus, this study intends to discover what constitutes the drivers of Blockchain adoption on Indonesia's financial services.

The aims of this research are to explain what is the technological, organizational and environmental factors that influence on intention to adopt blockchain on their organization and to find out the relationship between the factors on technological, organizational and environmental context. A multiple case study and qualitative approach is used for this study. Semi structured interview was conducted to 10 top management of financial services technology based companies. Furtherly, coding method was used to analyze the results. The outcome for this study is that all the factors on the proposed model of TOE frameworks is confirmed. All the proposed factors are influencing towards intention to adopt blockchain technology with positive, negative and no influence. In addition, there are some additional factors from each context. Availability, maturity, and observability; hype and image are added to technological context. Business model readiness is added to organizational context. Lastly, no factors added to environmental context.

Keywords: technology adoption, TOE frameworks, Blockchain technology, financial service

Factors Influencing Intention to Adopt Blockchain Technology: Case Study of Financial Services in Indonesia

Nadya Aulia Vitriastuti
19016064

Supervisor: Akbar Adhi Utama Ph.D
Undergraduate Program School of Business and Management
Institut Teknologi Bandung, 2019

ABSTRAK

Ekonomi digital di Indonesia telah menunjukkan pencapaian luar biasa dalam beberapa tahun terakhir ini. Pesatnya pertumbuhan ekonomi digital mengarah ke banyak implementasi teknologi. Salah satu teknologi yang muncul adalah Blockchain. Blockchain adalah fitur terdistribusi dari ujung ke ujung yang tidak memiliki otoritas pusat, sehingga orang dapat saling mempercayai dalam bentuk buku besar yang dapat dipercaya. Blockchain memiliki potensi untuk mengganggu dan membentuk kembali banyak industri termasuk layanan keuangan. Industri jasa keuangan adalah pengadopsi awal dan industri paling potensial untuk mengadopsi teknologi blockchain. Sementara itu, jumlah layanan keuangan blockchain Indonesia pada bisnis mereka masih terbatas. Namun, teknologi dapat direalisasikan saat diadopsi pada tingkat yang lebih luas. Dengan demikian, penelitian ini bermaksud untuk menemukan apa yang merupakan pendorong adopsi blockchain pada industri keuangan di Indonesia.

Penelitian ini bertujuan untuk menjelaskan apa faktor teknologi, organisasi dan lingkungan yang mempengaruhi niat untuk mengadopsi blockchain pada organisasi mereka dan untuk mengetahui hubungan antara faktor-faktor pada konteks teknologi, organisasi dan lingkungan. Pendekatan kualitatif dan studi kasus jamak ditujukan untuk 10 top manajemen di industri finansial. Wawancara semi terstruktur dilakukan untuk mendapatkan temuan. Selanjutnya, metode pengkodean digunakan untuk menganalisis hasil. Hasil untuk model ini adalah bahwa model kerangka kerja TOE dikonfirmasi. Semua faktor yang diusulkan berpengaruh terhadap penerapan teknologi blockchain dengan pengaruh positif, negatif dan tidak ada, ada beberapa faktor tambahan dari setiap konteks. *Availability, maturity, and observability; hype and image* ditambahkan ke konteks teknologi. *Business model readiness* ditambahkan ke konteks organisasi. Terakhir, tidak ada faktor yang ditambahkan ke konteks lingkungan.

Kata kunci: *adopsi teknologi, framework TOE, teknologi blockchain, jasa keuangan*

APPROVAL PAGE

**Factors Influencing Intention to Adopt Blockchain Technology: Case Study of
Financial Services in Indonesia**

By

NADYA AULIA VITRIASTUTI

ID No: 19016064

**A Final Project in Partial Fulfillment
Of the Requirement for the Degree of Bachelor of Management**

Undergraduate Program of Management Study

School of Business and Management

Institut Teknologi Bandung

August 1st, 2019

Approved By

Akbar Adhi Utama Ph.D _____

FOREWORD

Assalamu'alaikum Wr. Wb,

With this completion of final project, I would like to express my happiness and thankfulness towards Allah SWT that always helps me and loving me eternally. Thank you Allah SWT for helping me grow until now while learning many things in this life which helps me into who I am right now. I am very thankful for this completion of final project and besides that, I also want to express my gratitude to some people that has been continuously supporting me during this final project and college years:

1. First, I would like to thank my lovely and best family ever, Mama Reni, Papa Tri, Mbak Vina, Mas Avi, Aisha, Deena, Abe, Mbak Fitri for the everlasting love and supports for me. Especially for Mommy and Daddy, thank you for never giving up on me, praying for me and all of your kindness. Mbak Vina thank you for secretly super kind and caring for me. Abe, Aisha, Deena I love you my cute nieces and nephew.
2. Thank you for my supervisor Pak Akbar Adhi Utama for supervising me and giving me insights
3. For Ichsandy Rizky, thank you for giving me a lot of lessons, helping me to be honest with myself, for all your kindness to me I am truly grateful and thanks for growing with me spiritually and mentally. Although sometimes we argue a lot, I love the fact that we always tried to figure it out and giving each other supports. I hope we will grow stronger and be the better version of ourselves.
4. My lovely Yutub Halu, thank you for bearing with me and letting me being myself. Risma, Vane, Alda, Kika, Felia, Silvi, Dhito, Upi, Hasyim, Ichlas, Sasya. I love the way we shared memories together, getting know each other in a weird way, for all the laughter and happiness that I could not forget forever.
5. My dearest friend Firbas, thank you very much for literally being there for me whenever I need you, for listening to me, helping me with almost everything, I hope we will be friends forever.

6. For my college friend; Ina and Dhea, thank you for listening to my absurd story at college; Almer and Toto, thank you for being a funny and dependable friend whenever I need to tell story and play around.
7. For my friend since TPB, Arif and Gema. Thank you Arif for being such a kind and caring person especially during this final project completion. Thank you Gema for being a funny and weird friend of mine.
8. Special thanks for Tante Rida who guide me earn my spiritual and emotional stability through open heart meditation. Thank you very much!
9. For all the people that ease my life in Bandung; gojek driver, dormitory guard, campus security and all the people who smiles to me, Thank you! Your smile gives me strength.
10. Last but not least, I would like to thank myself for never giving up on yourself, trusting yourself that you can do this and continuously learning from your mistakes. Thank you for following what your heart leads us into and I hope we will be able to bring happiness to many people in the future.
11. And for all that I cannot mentioned here. Thank you very much for your kindness!

Warm Regards,

Nadya Aulia Vitriastuti
19016064

TABLE OF CONTENTS

ABSTRACT	i
ABSTRAK	iii
APPROVAL PAGE	v
FOREWORD	vii
TABLE OF CONTENTS	xi
LIST OF FIGURES	xv
LIST OF TABLES	xvii
CHAPTER 1 INTRODUCTION	1
1.1 Background	1
1.2 Problem Statement	3
1.3 Research Questions	4
1.4 Research Objectives	4
1.5 Research Significance	4
1.6 Research Contribution	5
1.6.1 Theory	5
1.6.2 Practical	5
1.7 Scope and Limitation	6
1.8 Research Outline	6
CHAPTER 2 LITERATURE REVIEW	9
2.1 The Evolution of Financial Services	9
2.1.1 Financial Technology on Indonesia	10
2.2 Blockchain Concept	10
2.2.1 How Blockchain Works	11
2.2.2 Types of Blockchain	13
2.2.3 Blockchain for Financial Services	14
2.3 Technology Adoption Theories	15
2.3.1 Technology-Organizational-Environmental (TOE) Framework	15

2.4 Research Model	16
2.4.1 Technological Context	16
2.4.2 Organizational Context	18
2.4.3 Environmental Context	20
2.5 Previous Study	21
CHAPTER 3 METHODOLOGY	23
3.1 Research Design	23
3.2 Research Method	24
3.3 Data Collection.....	24
3.3.1 Interview Method.....	25
3.3.2 Sampling Method.....	26
3.3.3 Target Respondent	27
3.3.4 Sampling Size	27
3.4 Data Analysis	28
3.4.1 Transcribe Interview Result	28
3.4.2 Content Analysis.....	28
3.4.3 Validity Test	29
CHAPTER 4 DATA ANALYSIS.....	31
4.1 Data Analysis	31
4.1.1 Participant Demographic.....	31
4.1.2 Overview of TOE Framework Analysis	32
4.1.3 Awareness of Blockchain Technology.....	33
4.1.4 Technological Context	33
4.1.5 Organizational Context	42
4.1.6 Environmental Context	51
4.2 Research Conceptual Model Findings	56
CHAPTER 5 CONCLUSION AND RECOMMENDATION.....	59
5.1 Conclusion.....	59
5.2 Research Implications	61
5.2.1 Theoretical Implication	61
5.2.2 Practical and Managerial Implication	62

5.3 Recommendations	63
5.4 Further Studies	64
REFERENCES	65
APPENDIX	75
APPENDIX I:	76
APPENDIX II	119
APPENDIX III.....	121
APPENDIX IV.....	123

LIST OF FIGURES

Figure 2.1 How blockchain works	12
Figure 2-1 Proposed Research Model	16
Figure 4-1 Modified Model	57
Figure 5.1 Modified Model.....	62

LIST OF TABLES

Table 2.1 Previous Research.....	21
Table 3.1 Interview Protocol.....	25
Table 4.1 Participant Demographic	31
Table 4.2 Overview of Findings.....	32
Table 4.3 Analysis on Security	33
Table 4.4 Analysis on Cost Efficiency	34
Table 4.5 Analysis on Transparency	34
Table 4.6 Analysis on Trust.....	35
Table 4.7 Analysis on Complexity (Negative Influence)	36
Table 4.8 Analysis on Complexity (No Influence)	36
Table 4.9 Analysis on Compatibility (Negative Influence).....	37
Table 4.10 Analysis on Compatibility (Positive Influence)	38
Table 4.11 Availability, Maturity and Observability (Positive Influence)	39
Table 4.12 Analysis on Availability and Observability	40
Table 4.13 Analysis on Blockchain Technology Maturity	40
Table 4.14 Analysis on Hype and Image.....	41
Table 4.15 Analysis on Hype and Image.....	41
Table 4.16 Analysis on Hype and Image.....	42
Table 4.17 Analysis on Organizational Readiness	42
Table 4.18 Analysis on Top Management Support.....	43
Table 4.19 Analysis on Top Management Support.....	44
Table 4.20 Analysis on Top Management Support.....	44
Table 4.21 Analysis on Top Management Support (No Influence)	45
Table 4.22 Analysis on Organizational Size (No Influence)	46
Table 4.23 Analysis on Organizational Size (Positive Negative Influence).....	46
Table 4.24 Advantages and Disadvantages on Organizational Size	47
Table 4.25 Analysis on Business Model Readiness (Compatibility)	48
Table 4.26 Analysis on Business Model Readiness	48
Table 4.27 Analysis on Types of Blockchain Suitable for Blockchain.....	49
Table 4.28 Analysis on Type of Blockchain.....	50

Table 4.29 Analysis on Regulatory Environment (Positive Influence).....	51
Table 4.30 Analysis on Regulatory Environment (Negative Influence)	51
Table 4.31 Analysis on Regulatory Environment (No Influence)	52
Table 4.32 Analysis on Market Demand	53
Table 4.33 Analysis on Network Effect	54
Table 4.34 Analysis on Timing	54
Table 4.35 Analysis on Competitive Environment	55

CHAPTER 1

INTRODUCTION

1.1 Background

The world is continuously changing and one of the significant driver is digital economy. One of the area which significantly affected by this phenomenon is Southeast Asia. According to Google and Temasek's e-Conomy SEA report (2018), Southeast Asia is the world's fastest-growing internet region, with internet user base of 260 million users. Indonesia is also experiencing the effect of digital economy which shown enormous achievement, it is shown by Indonesia's market size is almost 40% of total Southeast Asia digital economy (Google and Temasek's e-Conomy SEA report, 2018). This data indicate that digital economy is an important factor to drive Indonesia forward.

The rapid growth of digital economy leads Indonesian to use technology on their daily basis. These technological exposures also have issues and concerns specifically to privacy, security and data centralization (Jaoude & Saade, 2019). Meanwhile, the dissemination of information and its presence in various places will improve data theft's danger and likelihood. Moreover, Indonesia has historically struggled to keep accurate records due to a lack of expertise and resources (Suroyo and Diela, 2019). It is shown by Indonesia's vulnerability to fraud which proven by ACFE reports (2018) that states Indonesia as the 3rd country with the most fraud cases in Asia Pacific.

The vulnerability exposure of Indonesia's fraud is not only harming individuals but also business organizations. ACFE report (2018) states that the victims of fraud include private organizations, public organizations and governments. This means that internal and external fraud might happen within a business. ACFE Indonesia chapter report (2016) classified the types of fraud into three broad categories, namely Fraudulent Financial Statements, Asset Misappropriation and Corruption. Aside that, Hall (2015) states that Computer Fraud is one of the most dangerous fraud which might ease data theft from computers using internet. This high exposure towards fraud shows the necessity of trust.

The rapid growth of digital economy also leads to many implementation of technological innovation. One of the emerging technology is Blockchain. Blockchain is the underlying protocol of Bitcoins that is expected to disruptively revolutionize trust problems (Shyamasundar & Patil, 2018). Blockchain is also considered as one of the top 10 strategic technology of 2019 (Gartner, 2019).

The blockchain is a feature of a distributed ledger, which means that it is not controlled by any single actor, but maintained by several participants (The Economist, 2016a). This allows people who do not know or even have trust in each other to form a trustworthy ledger, where information is recorded (The Economist, 2015). The information is available to everyone and tamper proof, which allows the blockchain to be a transparent machine that makes and preserves the truth (The Economist, 2015). The three essential qualities of the blockchain are that it is a shared, trusted and public ledger (The Economist, 2016b).

Although cryptocurrency was its first extensive use, blockchain technology has the ability to revolutionize and disrupt various areas, including financial services industry (Atzori, 2015). The financial sector is one of the sector that could have a benefit from blockchain technology in terms of efficiency, speed and security (Dyulgerova, 2019). The phenomenon of digital economy also leads to many implementation of financial technology or fintech in Indonesia which shown by significant growth of fintech in Indonesia. According to OJK publication, the number of registered fintech on January 2018 is 32 and on May 2019 there is 113 registered fintech.

The financial industry is mainly facilitating the trusted exchange of value between multiple, untrusted parties. Brokering the trust is an important responsibility and it brings significant risk, which is why the financial service industry has become some reliant and costly intermediaries that includes manual process and errors (Azure, 2018). Blockchain technology is significantly considered for addressing integration of systems within organizations in order to create transparency and increasing trust in transactions.

On the other hand, Indonesia also had shown interest towards blockchain technology. It is shown by Indonesia Blockchain and Cryptocurrency Landscape Version 1.0 on

Coinvestasi.com (2019) that shows about blockchain ecosystem in Indonesia. According to the report, Indonesia already have 5 government body and associations, 13 blockchain projects, 18 cryptocurrencies exchange, 9 blockchain community, 5 blockchain consulting, 8 active protocols, 3 blockchain media, and 5 service providers.

Research on Blockchain technology has increased significantly these past two years. However, in Indonesia, there is still lack of research regarding adoption on Blockchain technology. There does not exist a comprehensive overview of what factor influence Indonesia's financial services on adopting blockchain technology on their business. The increased hype of Blockchain in Indonesia is a starting point for this study. However, the real value of a technology can be realized when it is being adopted at a broader level. Thus, this study intends to discover what constitutes the drivers of Blockchain adoption on Indonesia's financial services.

1.2 Problem Statement

The transformation of digital economy revolutionize business to go digital including financial service industry. When finance and technology evolve together, it leads to what is called as "FinTech" or Financial Technology which leads to numerous innovation such as Internet Banking, mobile payments, crowdfunding, peer to peer lending, Robo-Advisory, online identification, etc (Arner, et al., 2015). The evolution of Financial Technology growth could be an opportunity too for financial services instances to adopt blockchain technology. In additional, Indonesia had shown significant growth towards blockchain adoption shown by Blockchain companies in Indonesia have experienced an increase of more than 30 percent in 2018-2019 (Maulana,2019). This shown that Indonesian companies start to have interest towards adopting blockchain technology.

According to Rick Bleszynski on liputan6.com (2019), the most prepared industry for blockchain technology is financial services. Meanwhile, the number of Indonesia's financial service that utilize blockchain on their business is still limited. However, the real value of a technology can be realized when it is being adopted at a broader level. Thus, this study intends to discover what constitutes the drivers of Blockchain adoption on Indonesia's financial service technology based companies, this study intends to

discover what kind of factors are important to influence Blockchain adoption in Indonesia's financial service industry.

1.3 Research Questions

According to Kuan & Chau (2001), technological decision on an organization is not based on technological context alone, but also coming from organizational and environmental context. This concept will serve as a foundation for the differing research questions. Therefore, this study research questions are:

1. What technological, organizational and environmental factors that influence Indonesia financial services company on adopting Blockchain technology?
2. How each factor of technological, organizational and environmental influence on Indonesia's financial services company intention to adopt Blockchain technology?

1.4 Research Objectives

1. To explain what is the Technological, Organizational and Environmental factors that influence Indonesia's financial services company on their Intention to adopt Blockchain on their organization.
2. To describe the influence of technological, organizational and environmental factors on Indonesia's financial services company intention to adopt blockchain technology.

1.5 Research Significance

1. Blockchain is still newly emerging in Indonesia and on early stage of adoption. Meanwhile, the technology itself is gaining attention shown by the emerging Blockchain community in Indonesia and rising Blockchain startups. This study will analyze Blockchain technology adoption on firm's level by exploring the Technological, Organizational and Environmental context that would influence an organization on their intention to adopt Blockchain technology.
2. This study is one of few studies in Indonesia that discuss on Blockchain technology adoption. Due to Blockchain's early stage in Indonesia, most of the related research is focused on the technology itself, mostly about

cryptocurrencies. There is still confusion between cryptocurrency and Blockchain, the underlying technology of cryptocurrency. There are still limited studies regarding this matter and this study would provide more insights regarding Blockchain adoption in Indonesia.

1.6 Research Contribution

1.6.1 Theory

The findings of this study will contribute on models that concern technology adoption and acceptance for novel technologies. As there are already proposed model will be used regarding Blockchain adoption in a new context and different location. The financial service sectors have not been researched yet before in Indonesia on the context of Blockchain, the former proposed adoption model may be revalidated. Furthermore, there will be suggestions and additions for future research on this matter will be given.

1.6.2 Practical

1. Managerial

Blockchain is still a novel technology, therefore, companies are still trying to find out how to implement this technology on their company. This study identifies how firm's context-factors influence the adoption of new technology within financial service industry sector. A proposed framework would be tested and would explain the technology adoption factors for firms within the financial service industry sector. This study may contribute to practical viewpoints which concern the potential acceptance or denial of Blockchain technology and provide insight regarding the current contextual state of financial service industry within this matter.

2. Government

There is still no exact regulation regarding Blockchain technology in Indonesia. Meanwhile, Blockchain technology may continue to grow as financial service technology based companies are growing too. There will be needed a clearer regulation regarding this technology. This study will give insight regarding current contextual state of financial service industry on adopting Blockchain technology. It may give an insight too for Blockchain technology regulation in the future.

1.7 Scope and Limitation

There are limitations and scope incurred as follows for this study:

1. The object of this study is financial services technology based companies related sectors on Indonesia. This study would choose company which use financial technologies as part of their business model since this study is studying technology adoption in a firm's level. Financial services firm is chosen because it represents the most potential industry to implement blockchain. The chosen firm is chosen by their exposure towards Blockchain technology which divided by referring to Indonesia Blockchain landscape report 2019 (see Appendix IV). Researcher divide into the financial service technology based related companies in the report and financial service technology based related companies which is not on the report.
2. The data collected in Jakarta which its results may differ from other area. Jakarta area is chosen because most of emerging financial services based on Jakarta, due to limited time and possibility of access to data.
3. The data collected are limited on the period of 2019 which the study take times. Therefore, the results might be not applied other than 2019 where changes might occur in future years.

1.8 Research Outline

The research outline of this final report divided into five chapters as described below:

CHAPTER 1: Introduction

The first chapter consists and explains the background of this research, the problem statement, the research questions, the research objectives, and the limitation of the research.

CHAPTER 2: Literature Review

The second chapter provides some of literatures to support arguments of the research followed by a theoretical framework used in this research.

CHAPTER 3: Methodology

The third chapter discusses about the methods used in this research to answer research questions. This chapter consists of research design, data collection methods, and data analysis methods.

CHAPTER 4: Data Analysis

The fourth chapter discusses about the analysis of findings to answer the research questions specifically.

CHAPTER 5: Conclusion and Recommendation

This last chapter sums up all the findings from the research, and provides some recommendation for related-parties and future research.

CHAPTER 2

LITERATURE REVIEW

2.1 The Evolution of Financial Services

Financial services can be defined as activities, benefits and satisfactions, connected with the sale of money, that offer to users and customers financial-related value (Meidan, 1996). Financial services organizations are transforming their financial service industry with emphasizing customer-centric services that would be capable of combining speed and flexibility, backed by forward-looking strategies and cutting-edge business model (Nicoletti, 2017). Buckley (2016) defines “FinTech” or financial technology when financial service organizations transform their business with utilizing technology to deliver financial solutions. The evolution on financial technology until now has been unfolded into three stages consists of FinTech 1.0, FinTech 2.0, FinTech 3.0 and in the future it is predicted to be FinTech 4.0.

Date	1866-1987	1987-2008	2009-present	
Era	Fintech 1.0	Fintech 2.0	Fintech 3.0	Fintech 3.5
Geography	Global/developed	Global	Developed	Emerging
Key Elements	Infrastructure	Banks	Start-ups / New Entrants / Innovators	
Shift Origin	Analogue linkages	Digitalization	2008 financial crisis	Last mover advantage

Table 2-1: Summary of FinTech evolution
Source: (Arner, et al., 2017)

The first generation of FinTech called FinTech 1.0 occurred from 1866 until 1967. On this era, financial technology is started to connect with technology although financial industry is still analogue. Telegraph and telephone are one of the technology mainly used on FinTech 1.0 era. This era continues with second generation of FinTech called as FinTech 2.0 where developed countries start to utilize and innovate technologies showed by usage of ATM (Automatic Teller Machine) and e-banking. The third era called FinTech 3.0 is started from 2009 until now. The emerging technology on FinTech 3.0 explains that providers of financial services might not solely rest with regulated financial services industry which proven by the emergence of nonbank institution which mainly

used a technology innovation on its process (Mohamed & Ali, 2018). According to Arner, et al. (2017), FinTech 3.0 occurred on developed countries due to its connection to 2008 financial crisis. Meanwhile, countries in Asia does not though the 2008 financial crisis. However, although it takes longer time for starting the third fintech generation but Asian countries are fast to catching up that only takes a few years, therefore the era is called FinTech 3,5 (Arner, et al., 2017).

2.1.1 Financial Technology on Indonesia

According to Iman (2018), Fintech emerged in a high speed in Indonesia since 2010. This emergence is a result of the massively developed information and communication technology in Indonesia during last decade. Hung and Luo (2016) define Fintech as “the combination of both domains that will lead innovative financial services to shift away from an in-house approach to relying on external providers to deliver online and mobile solutions in a timely manner”. According to DailySocial’s Fintech Report 2018, there are six kinds of Fintech player in Indonesia consists of nonbank payment system, investment management, capital raising, insurtech, market provisioning, and deposit & lending.

According to Iwasaki (2018), Fintech on Southeast Asia has a big potential to solve the many issues affecting the financial environment. The situation of financial services on Southeast Asia which majorly are developing countries is still underdeveloped and there are a lot of room of improvements available in many countries including Indonesia. Iwasaki (2018) also explains that Blockchain technology has that potential, but full scale practical implementation is still some distance in the future.

2.2 Blockchain Concept

According to Seebacher & Schüritz (2017), Blockchain is a distributed database where every data is shared among and agreed by a peer-to-peer network. This technology allows group of users to record their transactions in a shared ledger among their group and when Blockchain operates then user cannot change their transaction once it has been published. The data cannot be altered which makes Blockchain into an immutable record of past activity.

The idea behind Blockchain was constructed firstly on 1991 by cryptographers Stuart Haber and W. Scott Stornetta in their paper which title was “How to time stamp a Digital Document” (Stornetta & Haber,1991). There was a problem found within time stamping a digital document due to the possibility of digital files can be altered. The solution provided to address the problem as cryptographic and algorithmic trust, among parties, to build trust from third party or each other. The idea of the cryptographic trust between parties by Haber and Stornetta did not spread the masses although this idea formation is on the same era with early days of internet.

However, this concept is arousing by Satoshi Nakamoto on 2008 who published his white paper and introduced Bitcoin (Nakamoto,2008). With the higher maturity level of internet on 2008, Satoshi Nakamoto construct a distributed ledger system where the transactions are verified by nodes of network (Antonopoulos,2016). Bitcoin is a digital, decentralized financial protocol and pseudonymous currency where all the transactions is visible and transparent. It is capable to connect any computer in the world to establish an open accounting book (Feld, Schönfeld, & Werner, 2014). It also relies on peer-to-peer network and cryptography. Bitcoin is an advanced system of payment transaction which utilize money as a digital form. Bitcoin is one example of the online currency known as cryptocurrency.

2.2.1 How Blockchain Works

Blockchain is a ledger that allows recording file and compiling its transaction where each blocks are added in a linear chronological order (Probst, et al., 2016). It enables a digital form value transfer without requiring a central authority or middle man to verify and validate the transaction. The term ledgers previously used by bankers and governments for storing transactions that are connected to land possession and other activities for maintaining transaction record (Atlam & Wills, 2018). Wills (2018) explains that the major problem is how to maintain and build trust relationship between parties. This problem is facilitated with the role of bank or government as the central authority to keep track and control the changes in transactions and contracts to define who possess what. Therefore, the role for identifying between the real and fake transactions can only be done by central authority. However, Atlam & Wills (2018) argued that these centralized ledgers

are black-boxed due to the ledger contents are only able to be seen directly by the central authority.

On the other hand, Karp (2015) argued that blockchain offers the next level of users trust where blockchain able to eliminate the necessity of middleman and mitigate the risk of human error. Gupta (2018) explains that the term blockchain comes from the way blockchain store its transaction data by linking the blocks together to form a chain (Figure 2-1). Gupta (2018) also explains that each block record and confirm the transaction's time and sequence which then logged into blockchain network driven by the network participant's rules that has been agreed on.

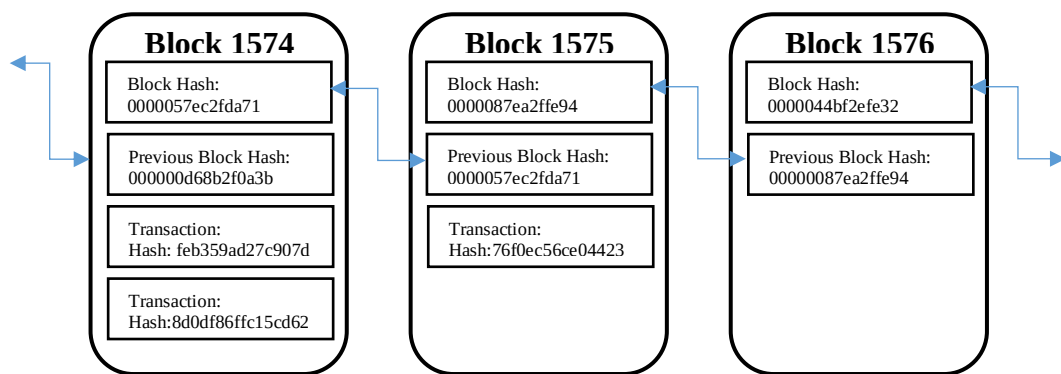


Figure 2.1 How blockchain works

Source: (Gupta, 2018)

Blockchain stores transaction records in a series of connected blocks. (Gupta,2018). Gupta (2018) also explains about each block fills with a *hash* – a digital fingerprint or unique identifier -- , timestamped batches of updated verified transactions and the hash of previous block. The newly added block will be added permanently on the ledger only when this block has been verified by all participants in the network and when a conflict detected in the block then it would be discarded (Atlam & Wills, 2018). The previous block hash connects the blocks together and gives a security for any block being altered or another block being inserted between another two existing blocks (Gupta, 2018). This strengthens how each blocks have trustable verification of the previous block and the entire blockchain network. The possibility of having a fake ledger is impossible due to

all participating users on the network have a genuine copy of the ledger to be compared with. (Antonopoulus, 2014).

Gupta (2018) points out that the main function of blockchain contains transaction data, it is not a replacement for databases, messaging technology, transaction processing, or business process. Instead, blockchain can verifies proof of transactions. Blockchain is beyond for only recording transactions or traditional database, it also removes possibility for fraud by malicious actor (Gupta, 2018).

2.2.2 Types of Blockchain

Blockchain is classified into three types: public blockchain, private blockchain and consortium. A Public blockchain is a fully decentralised blockchain that have no permission to join the network and anyone can participate in the network (Massessi, 2019). Anyone can read, write or send their transaction and join the consensus process (V. Buterin, 2015). Once the transaction of data recorded over the network, the data cannot be changed anymore. That is the reason why public blockchain are secure because no one has control over the network (Massessi, 2019).

Private blockchain is the opposite of public blockchain because private blockchain is a permissioned network that restrict the capability of the participants and restrict who is allowed to join the network. Private blockchain use privileges to control the participants to read or write data to the blockchain. Therefore the write permissions are kept centralized to one organization (Massessi, 2019). The advantage using this type of blockchain is faster and scalable.

Consortium blockchain is the hybrid or combination between the two types of blockchain mentioned before (public and private blockchain). As they constructed by several organization and partially decentralized, the capability among the participants is decided in the consortium (Elias & Das, Gautam, 2018). The consortium blockchain also adopt the advantage of the two other types of blockchain, depends on the configuration and capability of the participant on the consortium blockchain.

2.2.3 *Blockchain for Financial Services*

Blockchain technology is primarily applicable to financial industry due to blockchain first use cases as a digital money known as cryptocurrencies (Piscini, et al., 2018). According to Pratap (2018), thousands of funds are being transferred regularly from one region of the world to another on each day proves global financial system is the aspect that would be benefited through the implementation of blockchain. According to Global Fintech Report 2017, 77% of FinTech organizations are expecting to adopt blockchain as their organization process by 2020.

Financial institutions main role is to keep money safe and secure which requires a lot of mediators (Pratap, 2018). Pratap (2018) explains that this involvement of mediators makes the industry costly and a lot of people included which increase the chances of errors and frauds. Ito (2018) claims blockchain would transform banks similarly with what internet did to media in a way of blockchain characteristic of its security, safety, decentralized, transparent, cheaper on solving money matters. The involvement of Blockchain technology is to help securing transaction increasing satisfaction for customer experience and less cost.

There are many ways that blockchain would ease financial services industry. The first use case is on solving trade financing. Gupta (2018) defines about trade finance role for delivery and payment assurance between buyers and sellers. Blockchain network able to execute complex transaction and share the information between all involving parties including exporters, importers, banks and all required parties on one common distributed ledger (Pratap, 2018). Pratap (2018) furtherly explains that when the deals are met, the smart contracts will automatically execute themselves and all of the parties can view the transactions.

The second example of use cases is on executing KYC or Know Your Customer function. Know Your Customer (KYC) is the process of how a business identify its client identity and understand its client activities to assess money laundering risk (Koren, 2018). According to Pratap (2018), all of these process requires a lot of time and have to be assessed individually by all the banks and financial institutions. To ease this process,

automated customer identification technology is needed to make the process more effective and efficient (Attria, 2018). Attria (2018) explains that blockchain technology able to automate the opening of account process and share the KYC information and documents through a digital single source identity. This would reduce resource cost but still able to maintain the data privacy.

2.3 Technology Adoption Theories

There are many theories have been used to analyze the technology adoption factors on IS research (Davis,1986). Among these theories, the theory that discussed technological adoption on firm level are DOI and TOE. Meanwhile, TPB, TAM, and UTAUT discussed individual level of adoption. As this research aims to approach at firm level, therefore only DOI and TOE is a match for this research. DOI models include technological characteristics including relative advantage, complexity, compatibility, observability, and trialability that may increase or decrease on technology adoption (Fichman,2004). DOI models need to be integrated with other aspect for better understanding of technology adoption (Sila,2013). However, technological characteristics are not efficient to stand alone as a firm competitive advantage. It needs to be combined with organizational and environmental resources to produce business value (Mata et al. 1995; Wade & Hulland 2004). TOE framework has been used by many studies regarding technology adoption due to its useful analytical framework for studying adoption of different types on IT innovation (Oliviera & Martins, 2011). This framework emphasizes on technological, organizational and environmental factors to study firm level on adopting a technology (Sila,2013).

2.3.1 Technology-Organizational-Environmental (TOE) Framework

There previous organizational adoption theories were considered not able to include important factors, such as environmental factors on making decisions for adoption (Chau and Tam, 1997; Robertson and Gatignon, 1986; Kwon and Zmud, 1987). TOE framework sees the context of organizational on three aspects: technological, organizational, and environmental that would effect on influencing organizations on utilizing new innovation of technology (Tornatzky and Fleischer,1990). TOE framework was developed on IT relates studies for investigating the likelihood of technological innovation adoption.

According to Zhu et al.(2004), TOE is mainly used for investigating the adoption of Information Systems in a organizations.

2.4 Research Model

This study will use a TOE framework adapted by (Clohessy, et al., 2018) where its literature has revealed eight predictors across these three contexts :

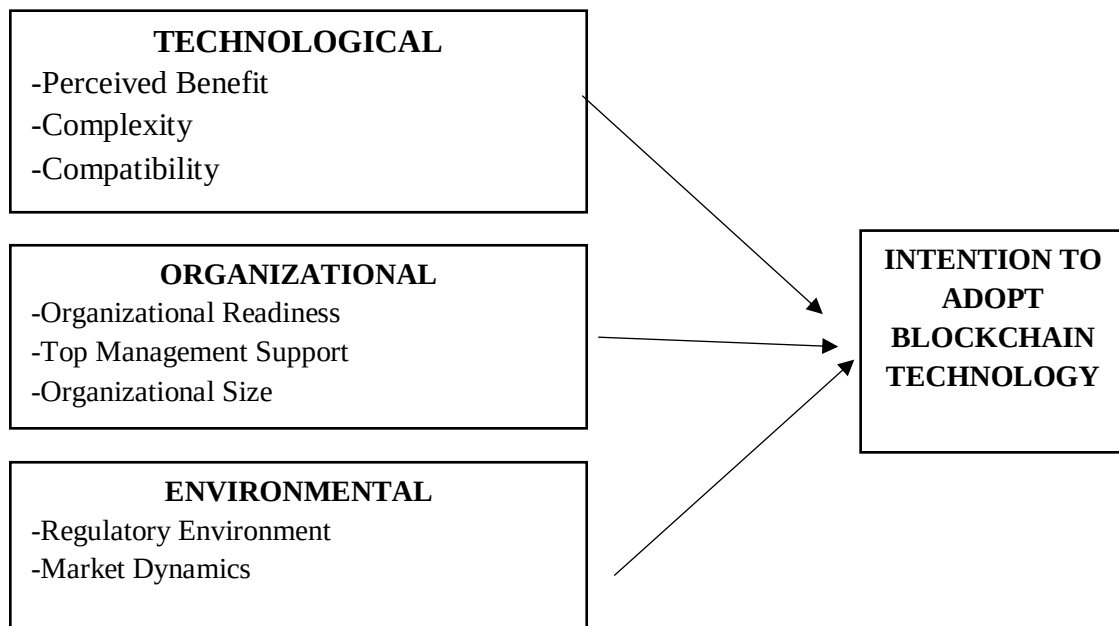


Figure 2-2 Proposed Research Model

Source: (Tornatzky and Fleischer, 1990) adapted by (Clohessy, et al., 2018)

Clohessy et al., (2018) picks the top factors which consists of 8 or more previous study results. From technological considerations, three factors stand out which consists of perceived benefits complexity and compatibility. From organizational considerations, three top factors chosen are organizational readiness, top management support and organizational size. From environmental consideration, the two standout factors are regulatory environment and market dynamics.

2.4.1 Technological Context

The technological context consists of all aspect of the technology relevant to the organizations including internal technologies the organizations has been using and the technologies available on the marketplace but not in use yet (Baker,2012). The chosen

factors for this study are perceived benefit, complexity and compatibility. For this study, the technology discussed is Blockchain technology.

2.4.1.1 Perceived Benefit

Tornatzky and Klein (1982), Premkumar and Roberts (1999), Rogers (2003) stated that perceived benefits of a technological innovation represents an organization expected advantages. In innovation context, perceived benefit is referred as relative advantage. According to Karayanni (2003), perceived relative advantage or perceived benefit is the degree to which an innovation is perceived to be better than the previous idea. Khemtong and Roberts (2006) mention that some previous study have shown that perceived benefits is the best predictor for technology innovation adoption. This study refers perceived benefits to the extent of management recognizes Blockchain technology for their business organizations. Several literatures shown that perceived benefit is a significant determinant of technology adoption. For example, it is a significant determinant of e-commerce adoption (Grandon and Pearson, 2004).

2.4.1.2 Complexity

Complexity is the degree to which an innovation is perceived as relatively difficult to understand and to be used (Rogers, 1995). If a technology tends to be easier to be integrated with business operations then the chance of its adoption would be higher (Oliveira, et al., 2014). When an innovation takes a longer time to be understood and implemented then the more likely that the complexity of an innovation turns into an technology adoption barrier (Stieninger & Wagner, 2017). That is why the complexity of an innovation affect negatively to its adoption rate (Rogers, 1995). Furthermore, blockchain is still in its early stages which may daunt organizations away from acquiring such technologies (Castellanos & Rosenbush, 2019). Therefore, complexity is another important influencing factor of new innovation or technology.

2.4.1.3 Compatibility

Compatibility is defined as “the degree where innovation of technology is perceived as being consistent with existing operating practices, beliefs, values, past experiences and needs” (Rogers, 2003). It defines the way technology matches with the existing values,

past experiences and needs of adopter (Rogers, 1995). An organizations tend to adopt a technology when they perceived the technology is consistent with their beliefs, culture, values and no resistance within the organizations (Brown & Kaewkitipong, 2009). The greater the compatibility matches with current and felt needs, the greater the rate of innovation diffusion (Mndzebele, 2013). Compatibility could be the main determinant of innovation implementation as long as there is available infrastructure on the organizations because companies do not want compatibility as a main problem when they implement IT innovation (Lee & Kim, 2007). Compatibility may have a positive impact on deciding whether a new innovation would be implemented.

2.4.2 Organizational Context

Lippert and Govindarajulu (2006) defined organisational context as the available resources on an organizations who able to support the adoption of an innovation. This refers to the organisation characteristic that facilitate or constrain the adoption and innovation implementation (Oliveira, Thomas & Espadanal, 2014).

2.4.2.1 Organisational Readiness

Organisational readiness is conceptualized as the availability and capability of specific organisational resources to adopt new IT innovations (Lacovou, Benbasat and Dexter, 1995; Weiner, 2009; Wang et al., 2010). According to Asif and Mandviwalla (2005), organisational readiness is considered as the important factor towards adoption of technology innovation. Organizational readiness varies according to the internal characteristics and property of a firm in relation to the type of new technology to be adopted (Muhammad Hashim et al., 2016). The concept of organisational readiness is often refers to three aspects, including human resource, financial, and infrastructure aspect (van de Weerd et al., 2016). First, the human resources aspects are related to employees knowledge and skills related to adopting and implementing new technology innovation (Zhu, Kraemer & Xu 2006; Wang et al., 2010; Low, Chen & Wu, 2011). Second, financial aspect related to financial resources commits to organizations new technology innovation (Weiner, 2009). Finally, infrastructure aspects refer to the installed IT that provides a platform on which new IT innovations can be built (Zhu, Kraemer &

Xu, 2006; Wang et al., 2010). This study defines organizational readiness as the capability of organization's management to adopt Blockchain technology.

2.4.2.2 Top Management Support

Top management support plays a pivotal role in the initiation, implementation, and adoption of information technology (Parasuraman, 2000). This kind of support is seen in their initiatives and engagements related to the adoption of new innovation within the organization. Top managers are creditworthy for the setting of strategies and administering direction for the new innovative technologies. Their awareness about the potential benefits of adopting blockchain technology is considered as important to manage likely organizational change through an explicit vision and dedication, sending positive signals of sureness about the adoption of the new innovation to all employees working for the organisation (Goscinski and Brock, 2010). This support avoids any internal roadblocks and opposition to change. Therefore, it can be concluded that top management support is important for organizations concurrence to produce a competitive environment, as well as rendering the required resources needed to adopt cloud computing platform. This study defines top management support as the capability of organization's management to adopt Blockchain technology.

2.4.2.3 Organizational Size

Organizational size is often positively significant with adoption due to its effect on adoption. Rogers (2010) states that large size organizations often possess more resources to adopt new technologies and have more capability to deal with mistakes. Meanwhile, smaller size organizations may be more flexible to deal with new systems within their organizations. According to Mendling, et al., (2017) and Tapscott, et al., (2016), organizational size is considered as the significance predictor towards blockchain adoption. A study by Clohessy, et al., (2018) suggest that larger organizations are more flexible to adopt Blockchain technology than smaller organizations. The reason behind this statement is because larger organizations have more complex and many facilities within their organizations which able to affect positively to an adoption (Lee and Xia, 2006). On the contrary, smaller organizations like Small Medium Enterprises (SME) have more barriers to adopt IT inovations due to its lack of resources on human resource and

small IT budgets (Thong, 1995). However, (Clohessy, et al., 2018) states that opposite condition may occurs when it applies on specific IT innovations. For example, studies by (Van de Weerd et al., 2016) explains that SMEs are more likely to adopt cloud computing technologies rather than larger institutions. Therefore, this study intends to find out how this applies on Blockchain technology adoption.

2.4.3 *Environmental Context*

The environmental context consists of industry structure, presence or absence of technology service producer and the regulatory environment (Baker, 2011). Basically, the environmental context or called as external context covers the business organization's macro area including element of the market and the technology service producer presence (Gutierrez, et al., 2015).

2.4.3.1 *Regulatory Environment*

Regulatory environment is related to government action towards new technology through reviewing and resolving related issues such as consumer protection, financial integrity and lack of legislation specifically regarding distributed ledger technology or blockchain (Clohessy, et al., 2018). The term regulatory environment could be referred as regulatory support from government (Oliveira, et al., 2014). According to Simrie et al., (2011), business regulatory environment plays a main part of business activity. Financial sector is one of the most affected industry by regulatory environment due to its regulatory mandates oriented toward transparency and market risk reduction (Moreno, 2014).

2.4.3.2 *Market Dynamics*

The term "dynamics" in market dynamic refers to market reaction to change in the future as a function part to implementation for new growth strategy (Urbany & Davis, 2012). According to Wilkinson (2013), market dynamics is the factors affecting demand and supply of products in the market and it is important as this effect practical business applications. From a business viewpoint, market dynamic refers to the factor that effects the business model (Wilkinson, 2013). According to Urbany (2012), there are three things to be considered when anticipating market dynamics. It consists of anticipating customer, competitor and capability dynamics. Gottinger (2016) investigated that market dynamics

is considered as a sequence of innovations. To compare market dynamics, when product market tends to be competitive then there is increasing dominance. It means, when innovation is drastic, the market dynamics is also increasing (Gottinger, 2016). Market dynamics refers to the rapidly changing Blockchain technological landscape which is forcing organizations to review their existing business processes to assess how they can use Blockchain as a technology differentiator (Clohessy, et al., 2018).

2.5 Previous Study

Previous studies related to technology adoption and blockchain are presented as follows:

Table 2.1 Previous Research

Author/Year	Objectives	Result
Trevor Clohessy, Thomas Acton and N Rogers (2018)	To find factors from Technological, Organizational and Environmental context from literatures related to technology adoption, blockchain and related IS topic.	Overall there are eight factors found from the literature reviews. From technological context, there are three significant factors that consists of perceived benefit, complexity and compatibility. From organizational context, there are three significant factors that consists of top management support, organizational readiness and organizational size. From environmental context, there are two significant factors that consists of regulatory environment and market dynamic.
Trevor Clohessy and Thomas Acton (2019)	To find out organizational factors influence on blockchain adoption organization on Ireland. This research is a continuance to the previous research in 2018.	This research finding are identified on three main points. The first point is that top management support and organizational readiness are related and both important for enabling blockchain adoption. Lastly, large companies are more possible to adopt blockchain than small companies.
Joseph M Woodside; Fred K Augustine and Will Giberson (2017)	To give an information and review the acceptance of blockchain and use of blockchain in the future.	Blockchain technology has potential to disrupt many industries on the businesses. It was found that blockchain has a big potential to disrupt accounting industries. Multinational companies already start to try blockchain applications. Along with big firms starting to adopt blockchain, it was seen same as the phenomena of internet entrance on 1990s.
Hayati Yusof et al., (2018)	To investigate the influencing factors of behavioral intention to adopt blockchain technology on banking institution in Malaysia	From Unified Theory of Acceptance and Use of Technology (UTAUT), the findings shows that Performance Expectancy, Social Influence and Facilitating Condition has significant relationship with behavioral intention to adopt blockchain technology. From all the four key factors, only Effort Expectancy shows an insignificant relationship.
Friedrich Holotiuk & Jürgen Moormann (2018)	To explore and understand better organizational factors on blockchain technology	To enable blockchain adoption, managerial relevance is important since firms are going

Author/Year	Objectives	Result
	adoption	through the technology transformation of blockchain.
Anders Tveita and Martin Borander (2018)	To find out which individual, social and organizational factors are important for adopting blockchain.	The results shows that subjective norm and perceived usefulness are important for adopting blockchain technology.
Max Marc Oosenburg (2018)	To find out how technological, organizational and environmental context factors influence the adoption of blockchain technology in legal sector.	Factors derived from the literature had either positive or negative influence. There are three new factors added that consists of type of work; hype and image; employee input.

CHAPTER 3

METHODOLOGY

3.1 Research Design

Research design is important in order to design research framework to get an information that is important to solve a research problem. Below represented this study research design for this study:

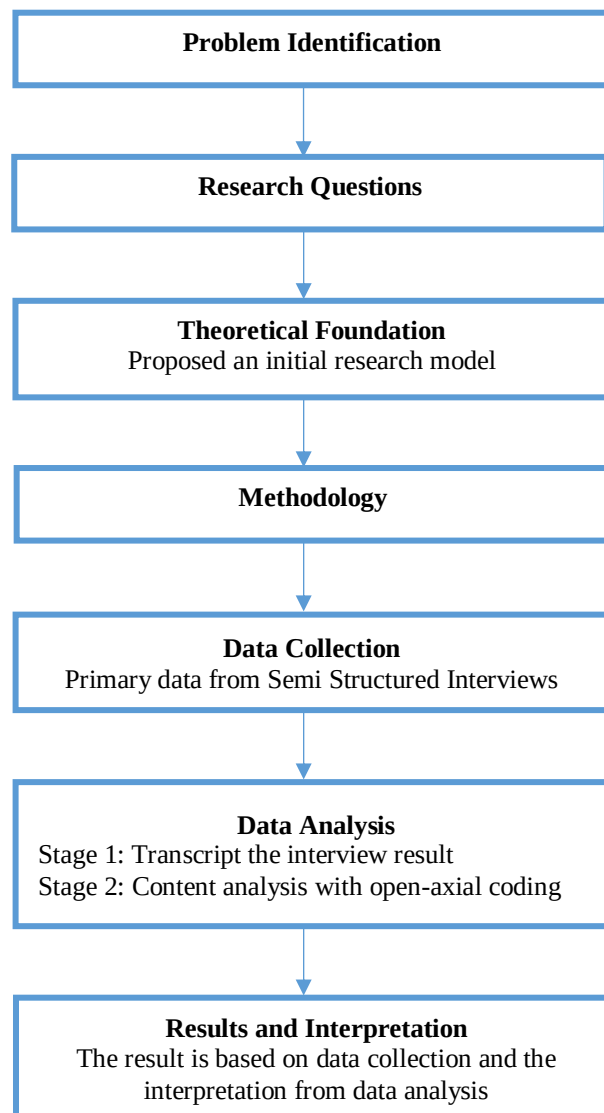


Figure 3.1 Research Design

3.2 Research Method

The purpose of this study is to explore the technological, organizational and environmental factors that may influence the adoption of blockchain technology in financial service industry. The study also sought another unidentified factors on proposed TOE frameworks towards blockchain technology adoption in financial service industry. The adoption rate of blockchain technology in Indonesia is still relatively low and phenomenon of blockchain in Indonesia has poorly examined since the entrance of blockchain technology is still considered new. Based on this explanation, a qualitative method is chosen because researcher want to gain underlying reasons and perspective from the participants.

Qualitative method is data collection techniques or method of analysis that sets non-numerical data (Saunders, Lewis & Thornhill, 2009). Qualitative approach is portrayed by its points, which identify with seeing some part of public activity, and its techniques which produce word, instead of numbers, as information for investigation when all is said in done (Patton & Cochran, 2002). A multiple case study approach is chosen for this study because this study is going to explore from numerous participants with different backgrounds. There are two kinds of case wants to be identified which going to be perspective from adopter and non-adopter of blockchain technology. However, due to the low adoption rate in Indonesia, the participants are going to be divided based on their association with blockchain technology. This association is based on their involvement in Indonesia Blockchain and Cryptocurrency Landscape 2019 (see Appendix IV). On the other hand, their involvement is not a guarantee that they adopt blockchain technology in their company. However, researcher assumed that they have high knowledge and awareness towards blockchain technology. Case study protocol is used as a guidance for researcher to conduct interview (Appendix II)

3.3 Data Collection

This chapter consist of detailed explanation of this study data collection.

3.3.1 Interview Method

This research utilized semi-structured interview as its method. Therefore, the interviewer has a question guideline that the respondents able to follow. Researcher would more likely to conduct an open ended questions and answers that would allow the respondents to talk freely regarding their opinions on blockchain technology adoption. However, because this study is sought to be exploratory, researcher did not impose participant to answer some specific factors from the proposed model if they do not answer that question. Researcher and respondents able to conduct the interview in two ways, which is direct meeting and video call. Then, the respondent's answers are recorded in a voice record with taking a notes and later is transcript for analysis. The transcript of the conversation is further written on the appendix. Below is the interview protocol.

Table 3.1 Interview Protocol

Demographic and Company Information Questions	
Questions	
1. Type of financial services?	
2. Position in the company?	
3. What kind of product and services does your company offer?	
Blockchain Awareness and Adoption Status	
Questions	Source
1. Is there any new technology that being incorporated with your company? Ex AI, IOT, cloud computing?	Oosenburg (2018)
2. Have you heard about Blockchain before? If you know, what do you know about blockchain?	
3. What kind of product and services does your company offer?	
4. Do you have any expectations of Blockchain on your company or sector?	
Blockchain Usage	
Questions for adopter	
1. Why does your company use Blockchain? In what function do you utilize blockchain?	
2. In what way does Blockchain benefited your company and your customers?	
Questions for non-adopter	
1. Is there any new technology that being incorporated with your company? Ex AI, IOT, cloud computing?	
2. Have you heard about Blockchain before? If you know, what do you know about blockchain?	
3. What kind of product and services does your company offer?	
4. Do you have any expectations of Blockchain on your company or sector?	
TOE Framework Questions	
General TOE Question	Source
1. What is the significant factors that influence your company on using blockchain?	Oosenburg (2018)

2. Is there any obstacle or challenge when in the process of adopting blockchain technology?	
<i>Technological Context Questions</i>	Source
1. What is the technological characteristic of Blockchain that influence your company on adopting Blockchain technology?	Clohessy (2018)
2. How about the benefit of blockchain that may influence on company's intention to adopt blockchain technology?	Oosenburg (2018)
3. To what extent Blockchain technology is difficult to understand and to use? And does this affect the intention to adopt?	Oosenburg (2018)
4. Do you see Blockchain technology as relevant and fit for company needs and financial sector? Does it influence on company intention to adopt?	Oosenburg (2018)
<i>Organizational Context Questions</i>	Source
1. What do you think of organization role on adopting a new innovation, in this case to adopt Blockchain on your company?	Clohessy (2018)
2. How does Human resource, IT infrastructure and financial readiness of a company influence on adopting Blockchain technology?	Oosenburg (2018) and Clohessy (2018)
3. To what extent does top management influence the blockchain selection process?	Oosenburg (2018)
4. Does the size of the organization play a role with regard to the blockchain selection process?	Oosenburg (2018)
<i>Environmental Context Questions</i>	Source
1. How do you think the business environmental context effect on the company decision to adopt Blockchain?	Clohessy (2018)
2. To what extent does legislation and regulations constitute an obstacle or does it actually benefit from the selection process?	Oosenburg (2018)
3. Does market dynamic like market demand, competitors, market response affecting on company intention to adopt blockchain technology?	Clohessy (2018)
<i>Ending Questions</i>	
1. From the three context consists of Technological, Organisational and Environmental, what do you think is the most important factor to implement Blockchain as a new technology innovation?	Clohessy (2018)

Source: Author's Analysis

3.3.2 Sampling Method

First, the criteria for selected participants were decided based on non-probability method with purposive sampling and then the determining larger sample is based on snowball sampling. Purposive sampling is a kind of nonprobability sampling that choose participant with intentional choice because of the their qualities. This method also does not have fundamental theory to set number of participants (Etikan, et al., 2015). Purposive sampling involves the choice of the most beneficial subjects placed or in the best position to provide the necessary information (Sekaran, 2002). Besides purposive sampling, researcher also pursue a snowball sampling to find people which match the criteria since

it is very niche. This method help researcher to reduce the bias since it leads researcher to unknown but qualified participant based on the reference from previous participant.

3.3.3 Target Respondent

This study is conducted in order to find out what is the factor that able to influence Financial Technology companies in Indonesia on adopting Blockchain technology on their company. As this study using purposive sampling, the researcher expects certain criteria, where in this case, the selected participants would be those who are sufficed all these following criteria:

1. Due to unknown population which can represents the blockchain adoption phenomenon in Indonesia, researcher divide the participants into two categories based on their knowledge towards blockchain technology. The first category is assumed to have more knowledge about blockchain in Indonesia which known based on the financial service technology based related company located on Indonesia Blockchain and Cryptocurrency Landscape 2019 (see Appendix IV). The second category is assumed to have less knowledge about blockchain and the participant obtained from the previous participant recommendation.
2. Participant is working on financial service technology based companies located on Jakarta area. Jakarta was chosen because it is a central economical district in Indonesia which most of the company located there.

3.3.4 Sampling Size

The respondents number could extend until there are no more arising new themes found from the interviewed participants as a results of the data had reach its saturation (Marshall, 1996). Blockchain is considered as a technological phenomenon that still have ambiguities, therefore there are no rules for required sample size Patton (2002). Instead, the sample size is determined by what researcher wants to know, the research objective and what will be credible. Patton (2002) explains that qualitative method validity, benefits and insights is more correlated with the information richness of the case and the researcher analytical capabilities, rather than sample size. For this reasons, researcher selected 10 respondents with 5 companies from Indonesia Blockchain and cryptocurrencies landscape (see Appendix IV) and 5 companies from outside the

landscape based on previous participant recommendation. After gathering data from 10 participants, researcher concluded that a saturation point had been reached as no new themes were being uncovered. At this point the sample size was frozen and no new cases were added to the existing sample.

3.4 Data Analysis

This chapter would give details about data analysis method. The first one is transcript interview result, the followed by content analysis and lastly by validity test. The detail of each step explained below:

3.4.1 Transcribe Interview Result

The first step is transcribe the interview result for data analysis. The interview results is in form of voice recording format. The voice recording would be transformed into narrative data by writing every spoken word from the participants and interviewer. The narrative data will further be used for content analysis.

3.4.2 Content Analysis

Content analysis is executed based on the narrative data. Coding method is conducted to analyze the data. This study used open-axial coding as this study wants to explore and find factors for adopting blockchain technology in Indonesia and how this factors related to each other. The first step of the analysis is open coding. It requires researcher to identifying, naming, categorizing and describing the situation or phenomena found in the narrative text (Strauss and Corbin, 1990). Open coding is needed as researcher also want to explore another emerging factors outside the framework. Within this step, specific keywords that found in the narrative text were highlighted and in which represents a certain code. Researcher continue processing and analyzing all possible identified concepts and categories is found. The next step is axial coding. It requires researcher to identify the relationships between the identified categories (Halaweh, 2012).

3.4.3 *Validity Test*

The researcher uses a method of Triangulation to validate the result of the interview. Triangulation refers to a method used in qualitative research by involving a cross-checking multiple data sources to evaluate the extent to which all evidence converges in order to produce clear understanding as well as to test the validity (Cohen & Crabtree, 2006). In this research, the researcher decides to validate the findings by using researcher triangulation.

[This page is intentionally left blank]

CHAPTER 4

DATA ANALYSIS

4.1 Data Analysis

This study conduct semi structured interviews to 10 people that related to financial service technology based institutions. The interview results are analyzed to find out the influencing factors and challenges towards blockchain technology adoption. After that, find out any possible keywords which assumed as the perceptions and preferences that influence the interview participants to use blockchain technology on their organizations. The interpretation then categorized into the TOE (Technological, Organizational and Environmental) factors that influence the interview participants positively, negatively or both. There would be the first explanation regarding the interview participant's demographic information. The analysis is presented as follows:

4.1.1 Participant Demographic

Based on the interview, all of the participant's business implement technology on their business to deliver financial solutions. The participants selected is chosen based on their affiliation and non-affiliation with blockchain technology in Indonesia.

Table 4.1 Participant Demographic

Participant	Company Characteristics	Position	Knowledge Score	Adoption Status
P1	Non-Bank Payment System	Director of Business Strategy	2	Non-adopter
P2	Non-Bank Payment System	Chief Marketing Officer	2	Non-adopter
P3	Peer to Peer Lending	Chief Executive Officer	3	Adopter
P4	Conventional Bank	Vice President	1	Non-adopter
P5	Non-Bank Payment System	Chief Executive Officer	2	Non-adopter
P6	Robo Trading Platform	Head of Business Strategy	2	Non-adopter
P7	Conventional Bank	Head of Digital Banking	2	Non-adopter
P8	Cryptocurrency Trading	Lead Business Strategist	2	Non-adopter
P9	Cryptocurrency Trading	Chief Operational Officer	3	Non-adopter
P10	Peer to Peer Lending	Chief Technology Officer	3	Adopter

Source: Author's Analysis

4.1.2 Overview of TOE Framework Analysis

A cross-case analysis was conducted using extensive word table in order to arrive at new proposed research model. This table is created to see the summary of the data analysis and to see the factors across cases and how they relate to each other. With this table, throughout themes would be interpreted and seen on what way does the factor influence towards blockchain adoption (Ryan,2012).

There are several kinds of outcome from every factors on how it influences on blockchain adoption. First, when the factor was perceived as positive influence, then it would be represented by a “+”. Second, when the factor was perceived as negative influence, then it would be represented by a “-“. Third, when the factor was perceived as no influence, then it would be represented by a “0”. Fourth, when the factor was perceived as either positive or negative influence, then it would be represented by a “+/-“. Fifth, it could be any combination between the influencing factor.

Table 4.2 Overview of Findings

	PARTICIPANT →	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Technological Context (T)	Perceived Benefit	+	+	+	+	+	+	-	+	+	+
	Complexity	0	-	-	n.a	-	n.a	0	0	0	0
	Compatibility	-	n.a	+	n.a	+	-	-	+	-	+
Organizational Context (O)	Organizational Readiness	+	+	+	+	n.a	+	+	+	n.a	+
	Top Management Support	+	+	0	+	+	+	+	+	+	+
	Organizational Size	-	0	0	-	0	n.a	+/-	-	0	+
Environmental Context (E)	Market Dynamic	+/-	-	+	+	0	+/-	-	+	0	+
	Regulatory Environment	n.a	+	-	-	+	0	+/-	+	+	+/-
Additional Findings	Availability and Observability(T)	-	-	+	n.a	n.a	+/-	-	n.a	n.a	n.a
	Hype and Image (E)	-	n.a	n.a	n.a	n.a	n.a	n.a	n.a	-	+
	Business Model Readiness (O)	-	n.a	+	n.a	n.a	-	n.a	+/-	n.a	+

Source: Author's Analysis

4.1.3 Awareness of Blockchain Technology

Due to the purposive sampling, researcher wants to find the suitable person who knows blockchain. Therefore, all the participant knows what blockchain is. Although they are on different level. To categorize their knowledge, researcher use scoring (n=1,2,3) for differentiating the participant (Clohessy & Acton, 2019). The categories are divided into three categories. First, basic level with n=1, this requires participant has heard about blockchain technology before but cannot describe the concept of technology. Second, medium level with n=2, this requires participant has heard about blockchain technology before and able to explain accurately blockchain technology description. Third, high level with n=3 which requires participant ability to give a correct and rich description about blockchain technology and able to give blockchain use cases in real world. Based on table 4.1, there are 3 participants with high level, 6 participants with medium level and 1 participant with basic level. The three person with high level of knowledge is considered as a key informant.

4.1.4 Technological Context

4.1.4.1 Perceived Benefit

Perceived benefit refers to the benefits from participant perception about blockchain technology. Based on the interpretation there is some sub factors that supports towards blockchain consists of security, cost efficiency, transparency, trust that would be explained on the table in this sections.

- Security

Table 4.3 Analysis on Security

Category	Statement	Interpretation
Security	I think the fit word is “security”. So the verification process for each transaction would be more seamless and guaranteed.	Blockchain would be used because its advantage on security which allows seamless and guaranteed verification process. (P1,P9)
	So, decentralization is interesting in terms of the security because the cost might be reduced when it’s implemented.	Blockchain is secure because of the “decentralization” features and it is more secure in terms of hacker attack because nowadays it is easy to get attacked (P2,P5,P8)

Source: Author’s Analysis

In terms of security, there are 5 participants that states about this benefit. Financial institutions depend on security and technology to make sure data integrity and safety. Blockchain able to provide more flexibility and security with decentralization option for more seamless and reliable transaction processing. Since Blockchain use cryptographic functions, confidentiality of transactions data can be achieved (Vishwakarma, et al., 2018). Blockchain is also considered safer from hacker attack because of reliable chain of cryptographic hash where every block is connected to each other which have different hash (Golosova & Romanovs, 2018).

- Cost Efficiency

Table 4.4 Analysis on Cost Efficiency

Category	Statement	Interpretation
Cost Efficiency	P5: The cost efficiency, so on every country, when I want to send my money from my bank to your bank is very inefficient.... Every moved money is involving like 5 party.	Most countries have inefficient movement of money which involves more than three parties and blockchain able to solve that problem efficiently where blockchain able to cut all that intermediary parties using the distributed ledger. (P3,P4,P5)

Source: Author's Analysis

Blockchain is also able to reduce cost because of the decentralized system, there is no need to have more cost for intermediaries. It can keep transactions permanently which allows faster transactions at a reduced cost (Ferreira, et al., 2019).

- Transparency

Table 4.5 Analysis on Transparency

Category	Statement	Interpretation
Transparency	Second is transparency. ...It's in the blockchain. It's very clear.	Blockchain can gives a transparency in terms of the customers or users can see any information (total raised money, trading volume, how much token can be traded) in the blockchain clearly. (P3)

Source: Author's Analysis

Blockchain able to give transparency where every participant of the network able to see all the information shared. According to Gupta (2018), participants in a certain

transaction have the access to open the same records, they are able to give a validation to a transaction, and verify identity without third parties. Therefore, transactions are time-stamped, ordered and able to be verified real time.

- Trust

Table 4.6 Analysis on Trust

Category	Statement	Interpretation
Trust	Data verification is important because there could be up and downs sense of trust...in the world of fintech, trust is number one priority... there is “system verification” which already built in the blockchain.	Data verification is important because customer prioritize trust and blockchain has the “system verification” built in the blockchain which increase the trust. (P2)
	The most interesting feature of blockchain technology is the fact that you can have a fully trustable for a record without a central authority	Blockchain technology able to have a trustable data record without having centralization. (P4,P8,P9)
	When two people need trust, it means that one of them is potentially cheating. Because both of them need to do this than both have to be transparent and have control, that is why it needs trust. If trust is really needed, then blockchain can be used.	Blockchain is beneficial for things related with trust, especially when parties have business with each other. They need to be transparent and have control too to increase trust between each other. (P6)

Source: Author's Analysis

Since the beginning, bitcoin, the first application of blockchain is built because there is lack of trust. The cryptographic proof function over transaction in blockchain able to increase trust because the transactions cannot be tampered with and signed by relevant parties which able to detect a corruption in the network (Gupta, 2018). Blockchain ability to distribute its data where all relevant participants have all the data is the core strength that increase its trust (Sultan, et al., 2018). Blockchain is also build based on consensus which means that in order to verify transactions, all relevant network must agree that a transaction is valid, which achieved through consensus algorithms (Gupta, 2018). This consensus characteristic also proved that blockchain able to have trustable data record.

4.1.4.2 Complexity

There are two kinds of perception emerged along with complexity which consists of 5 participants think blockchain complexity has no effect on the adoption and 3 participants

who think that complexity is a negative influence. The reasons why complexity is perceived as a negative influence is shown on Table 4.7

Table 4.7 Analysis on Complexity (Negative Influence)

Category	Statement	Interpretation
Complexity	P2: When technology is more complex, than we would invest more on time and the cost is high too for training. Maybe this is an effect to from little socialization of blockchain	The higher complexity of technology then higher investment time and cost for training human resource. This complexity is an effect for lack of blockchain socialization in Indonesia. (P2)
	P3: The technology is hard. It takes time to learn the technology, build the process and security system.	Blockchain is a difficult technology where it needs time to learn, build the process and security system. (P3)
	P5: Complexity is more difficult because it is unregulated. It can be that the situation today and tomorrow is different so it is instable. (-)	System complexity because the system is unregulated so it is unstable sometimes. (P5)

Source: Author's Analysis

Blockchain is perceived as a negative influence because it is a complex technology which is not a simple and easy technology to be developed. It needs time to build the technology like the process and security system. Because of this complexity, a company needs to invest more to adopt blockchain especially with regards to train the resources. Lack of blockchain socialization is also one of the cause why blockchain is perceived as complex because people are not aware with what blockchain is and the benefit blockchain offers. In addition, blockchain is also perceived as an unstable technology because it is unregulated. The other opinion emerged is that complexity does not have any influence on intention to use blockchain technology as seen on Table 4.8:

Table 4.8 Analysis on Complexity (No Influence)

Category	Statement	Interpretation
Complexity	So I don't think the complexity of blockchain matters that much towards the adoption. As long as you clever engineers that can apply it that would be fine. (0)	The complexity of blockchain is not a barrier towards the adoption as long as there is a sufficient resource that able to develop the technology(P7,P1,P9,P10)
	P8: Basically the development is more complex than the adoption. But for the	The adoption of technology is easy because as an end user you just have to

Category	Statement	Interpretation
	adoption is not hard because you just have to use	use it. The hard thing is to develop the technology. (P8)

Source: Author's Analysis

On the contrary, blockchain is also perceived as an easy technology to be implemented as long as there is someone in the company with sufficient knowledge of blockchain technology or IT expertise. Another finding found is that the development of technology might be hard but the adoption for end user is easy.

For complexity, it can be concluded that the complexity of blockchain does inhibit firm's intention for adopting the technology. This complexity is also caused by external factors which is the lack of socialization for blockchain technology. This shows the low awareness of blockchain technology of some firms that might indicated Indonesia needs to educate more. However, this complexity is not a problem for a firm with IT experts on blockchain.

4.1.4.3 Compatibility

Based on the interview, compatibility is seen as one of the significant factors towards adoption. However, due to its significance it could be perceived both as a positive influence and negative influence. Rahayu (2015) states that compatibility refers to degree of conformity of technological innovation implementation to fulfill user needs and system that will run on the user environment. This statement aligns with the findings of this study where blockchain is influencing negatively on some cases which is presented on Table 4.9:

Table 4.9 Analysis on Compatibility (Negative Influence)

Category	Statement	Interpretation
Compatibility	But for now with current skills and business model, we don't see yet for any need for it.	Blockchain is not compatible enough to fulfill business model needs (P1)
	We don't see it yet why we have to be decentralized... it is more efficient if we run on centralized server like now	They do not saw the opportunity why they have to go decentralized using blockchain. Their company is more efficient if they use centralized server like what they do now. (P6)

Category	Statement	Interpretation
	Not yet, because not everything could use blockchain.	Blockchain is not capable to fulfill their needs because not every aspect in a business can use blockchain. (P9)

Source: Author's Analysis

In terms of negative influence, blockchain is seen to be incapable to fulfill a company business model. when blockchain as a technology is not able to fulfill the company needs in terms of business model, market demand, and problems that a company wants to solved. On the other hand, Table 4.10 indicated the positive influence from compatibility towards intention to adopt blockchain technology.

Table 4.10 Analysis on Compatibility (Positive Influence)

Category	Statement	Interpretation
Compatibility	P3: The other factors are technical, we needed a technology that supports smart contracts, which I mentioned. We needed liquidity. We needed a technology where the software tools to develop application for the technology were available and mature	The company's needs to make financial services more efficient with technology that supports smart contract, liquidity, maturity to develop software is relevant to what blockchain technology could fulfill.
	P5: So, if for example the problem that would be solve is transferring money...If in the back you got sent 1 million with transfer fee of Rp 1000 you would eventually use it right.	The problems the company want to solve is regarding transferring money with lower fee. Therefore, compatibility depends on which problem the company would like to solve.
	P10: So our business model will not be running without blockchain, therefore it is compatible.	The business model of the company is compatible with blockchain technology (+)

Source: Author's Analysis

From Table 4.8, Interviewee P3 needs a technology that supports them to develop application with smart contracts were blockchain able to address that needs. Interviewee P5 also feels that blockchain is relevant with problem that company wants to solve. In addition, business model of interviewee P10 cannot run without blockchain. From these statements, blockchain considered as a positive influence because blockchain is considered to be align with company needs, business model, and relevant with IT infrastructure of a company.

For compatibility, we can conclude that compatibility is really important as an influence that can effect both positively and negatively towards blockchain adoption because not every company is compatible with what blockchain can do.

4.1.4.4 Additional factor

- *Availability, Maturity and Observability*

This study found that availability, maturity and observability is related to each other. According to Oosenburg, availability, maturity and observability is also one of technological factors that influence on blockchain adoption. There are two situations emerged on this situation. The first condition is when availability, maturity and observability of blockchain technology was apprehend as a positive thing which influence intention to adopt it. It will be discussed further on Table 4.11

Table 4.11 Availability, Maturity and Observability (Positive Influence)

Category	Statement	Interpretation
Observability and Availability	We believe that this open up sukuk as an instrument as capital market tool to a whole new ecosystem for smaller issuers who want to raise money....We see blockchain as removing the inefficiency present in financial services Islamic especially financial market as the main thing.	Blockchain is seen to be able to play a role as am Islamic financial instrument at capital market for small issuers who wants to raise money but do not have a huge amount of money. Blockchain could remove the inefficiency on Islamic Financial Services. (P3)

Source: Author's Analysis

Based on Table 4.11, interviewee P3 able to observe the opportunity on the business which is beneficial with the use of blockchain technology. Therefore, the intention to the adoption is positive. On the contrary, it may also have a negative influence which seen on Table 4.12

Table 4.12 Analysis on Availability and Observability

Category	Statement	Interpretation
Observability and Availability	It's not obvious yet, what useful it has for consumer banking ...The only real application I know is probably cryptocurrency... and I don't yet see the other real application and so far they do not give other meaningful way.	It is not obvious yet what kind of benefit that Blockchain give to consumer banking. The only visible usage is cryptocurrency which is not related to the business. (P7)
	Blockchain is a new innovation and its usage is still minimum in Indonesia.	Blockchain is a new and still emerging technology that is still have minimum use cases in Indonesia (P1)

Source: Author's Analysis

Table 4.12 shows Blockchain is seen as a technology with minimum real use cases with success. Therefore, organizations are still confused whether they have to adopt this technology or not. The massive network effect of blockchain is not yet felt too. People still do not know what is the urgency and the real benefit of adopting blockchain. This lack of observable and available application of blockchain may indicated that blockchain as a technology is not yet mature. This will furtherly explain in Table 4.13

Table 4.13 Analysis on Blockchain Technology Maturity

Category	Statement	Interpretation
Maturity	This technology is still premature. There is still a lot of process update, unstable. We could say that there is still a lot of trial error.	Blockchain technology is not mature enough because there is still a lot of process update and instability. People still do some trial error. (P9)
	Technology will always be developing and technology like blockchain is not only one. I think some are mature and some are not. Although as a philosophy, blockchain is already mature.	Blockchain is a technology that is still developing. Blockchain has many type of network which all of them are separated and have their own maturity stage. However, as a philosophy, blockchain is already mature. (P10)

Source: Author's Analysis

Table 4.13 shows that as a technology, blockchain is still not mature yet because it is still considered new and many parties still looking on how to optimally use it. Blockchain is still unstable too because the technology itself is still on trial error. Blockchain has many kinds of network which makes some are mature and some are not mature yet. However, blockchain is already mature as a philosophy. In conclusion, availability, maturity and observability influence positively and negatively towards compatibility. When

blockchain is perceived as technology with low availability, maturity and observability and then they would have perceived it as not compatible with their needs.

- Hype and Image

Blockchain is considered to be a hype technology starts from bitcoin popularity. According to Oosenburg, hype and image is also one of technological factors that influence on blockchain adoption. However, many people use this moment of hype to adopt this technology. This popularity caused positive, negative and no influence. When the hype arise, firms wants to try this new technology which create a positive influence which is shown by participant statement on table 4.14:

Table 4.14 Analysis on Hype and Image

Category	Statement	Interpretation
Hype and Image	Because this is a new technology that has hype and in the end there are many use blockchain for the hype.	Blockchain as a new and current hype technology influence people to use it. (P10)

Source: Author's Analysis

However, it may also create negative influence because the irresponsible parties who use the hype of blockchain to attract investors fund their business. Instead, they did not finish the project and took the investor money away. This creates a bad image for blockchain technology on investors perspective that create a negative influence for blockchain adoption for businesses. This negative influence of blockchain popularity is explained on Table 4.15

Table 4.15 Analysis on Hype and Image

Category	Statement	Interpretation
Hype and Image	There are many project using blockchain hype and in the end they are missing which creates a bad image.	Many organizations use blockchain hype as their attractiveness to gain investors interest but in the end they failed and this creates bad image of blockchain technology. (P9)

Source: Author's Analysis

Despite the hype and the positive influence around blockchain, one interviewees thought that the hype does not have any effect on the adoption of technology which is shown on Table 4.16

Table 4.16 Analysis on Hype and Image

Category	Statement	Interpretation
Hype and Image	But if it is for the sake of trying the hype, we are not in that state anymore.	Blockchain hype does not affect towards its intention to adopt. (P1)

Source: Author's Analysis

Based on the findings found on this section, it is concluded that the hype of blockchain does have an effect on firms' intention towards its adoption. Although the response may vary, it could be seen that blockchain technology hype have positive influence for businesses to use it although there are some irresponsible parties that misused the technology for the sake of hype.

4.1.5 Organizational Context

4.1.5.1 Organizational Readiness

Organizational readiness refers to the ability of specific organizational resource to adopt technological innovation (Wang et al., 2010). Organizational readiness positively influences towards intention to adopt blockchain technology confirmed by 8 participant statements.

Table 4.17 Analysis on Organizational Readiness

Category	Statement	Interpretation
Organizational Readiness	It is basically changing IT infrastructure and landscape on a company. Therefore, the initial investment must be huge too.... There needs to be IT enthusiast on the company.	To adopt blockchain, a company must change the IT infrastructure and landscape which means their infrastructure must be ready. Changing the infrastructure needs a huge investment which means that a company must be financially ready too. Lastly, there needs to be resource with blockchain knowledge too.(P1)

	Resources need to understand. Leadership has to understand what is the business value and financial should be ready too	Human resources in company need to understand the technology. Leader or Top Management in the organization also need to know the business value and how it would match to the technology. Lastly, organization also need to be financially ready to adopt the technology. (P10)
--	---	---

Source: Author's Analysis

All of the statements on Table 4.17 indicated that organizational readiness is very important and influenced positively towards IT innovation adoption. From the participant's statements, there are three main things that considered to be important as an indicator of organizational readiness. First, an organization must be financially ready especially because blockchain development is not cheap. Second, an organization must have the proper and ready infrastructure because basically using blockchain will change the IT infrastructure and landscape of a company. Third, an organization must have adequate resource with blockchain knowledge or IT enthusiasts that would ease towards its adoption. These three findings are aligned with Clohessy, et al.,(2018) statements about organizational adoption. Organisational readiness is examined on three categories of organizational resources with employees competencies to have sufficient IT knowledge and skills; financial resources to adopt technological innovation and infrastructure where blockchain can be built (Clohessy, et al., 2018).

4.1.5.2 Top Management Support

Top management support has been identified as a key significant factor for influencing intention to the adoption of technological innovation (Kulkarni et al., 2017). Based on participant statements, 9 of 10 participant considered that top management supports influence positively towards the intention on adopting blockchain technology.

Table 4.18 Analysis on Top Management Support

Category	Statement	Interpretation
Top Management Support	In the end, we are the decision maker for everything.	Participant is on the top management level and top management is important because they are the decision maker on everything including blockchain adoption. (P1)

	Every change is started from the leader	Leader support enables to let other below in the company to follows in adopting technology. (P4)
--	---	--

Source: Author's Analysis

Table 4.18 represents the role of top management as decision maker of a company. It shows that in order to adopt blockchain technology, top management plays a big part because they are the leader and all of subordinates. Top management is also important because most of the technological innovation and information about emerging technologies like blockchain is only talked about on top management which stated on Table 4.19

Table 4.19 Analysis on Top Management Support

Category	Statement	Interpretation
Top Management Support	We know because we read about it which makes us actively search about it. Therefore, it is only exist on top management.	Top management recognize about blockchain because they actively search for it. However, this information only exist and shared in the top management. (P2)

Source: Author's Analysis

Information from Table 4.19 shows that top management is an enabler for blockchain adoption because mostly they know more about emerging technologies in the industry.

Table 4.20 Analysis on Top Management Support

Category	Statement	Interpretation
Top Management Support	Top management has many factor including finance, operational, technology research and business development... when the business starts so top management has to follow	Top management have many aspects of a business that includes financial, operational, technology research and business development (P2)
	Blockchain is very strategic then it has to come from top management and from partnership sides with whom they want to partnered with.	Blockchain adoption need to start from top managements because they know more about blockchain strategic and the partnerships in the organizations. (P7)

Source: Author's Analysis

Table 4.20 shows that top management also know precisely about the company strategy, business value, opportunity assessment and key partnerships where it would be important towards decision on adopting blockchain. Top management also have more knowledge and experience on financial, operational, technology and business development which is critical point of view that would help on adopting blockchain technology as company technological innovation.

Table 4.21 Analysis on Top Management Support (No Influence)

Category	Statement	Interpretation
Top Management Support	Government is the important one. I think top management support is not from business sides. Regulation is as important as business.	Top management support is not considered as an effect towards blockchain adoption. Government and regulation support is more beneficial. (P3)

Source: Author's Analysis

However, on Table 4.21, one participant states that top management support is not as important with regards to government or regulation support. In order to enable technological innovation, regulation and government is seen as the enabler to ease the adoption of blockchain. In conclusion, we could infer that top management support is very important and significantly influence on the intention to adopt blockchain technology because they know the company strategically and they are the main decision maker of company.

4.1.5.3 Organizational Size

This section will discuss how organizational size influences on organizational intention to adopt blockchain. Four kinds of influence come up as an effect for organizational size that consists of positive, negative, either positive or negative and no influence. The first one is organizational size is considered to be not an influence on the intention to adopt blockchain technology or technological innovation which shows on Table 4.22

Table 4.22 Analysis on Organizational Size (No Influence)

Category	Statement	Interpretation
Organizational Size	It is the same if you have 100 programmer compared 1 really advanced programmer. So, size does not really matter. It's all about the quality.	In order to enhance the technology, an organization should strengthen the quality of resources not quantity. (P5)
	No, it is not depending on the amount of resource but it is more depending to the revenue.	Size of organization does not matter. What matters is the revenue of a company. (P8)
	I think it is not important.... You don't need to be a huge company, you can be a really small company to implement blockchain	Huge organizations or small organizations does not matter for adopting blockchain. (P10)

Source: Author's Analysis

Table 4.22 indicate that organizational size had no influence because what matters towards the adoption is company revenue and quality of resources. Company revenue is crucial because the initial investment to adopt blockchain might be huge. Quality of resource is more important than quantity of resources because one really advanced programmer might have more advantage than 100 unskilled programmers.

Table 4.23 Analysis on Organizational Size (Positive Negative Influence)

Category	Statement	Interpretation
Organizational Size	P2: Organization size is an influence. Big is even more difficult, if it's small, it's even faster to adopt.	When an organization size is bigger than it would be more difficult to adopt blockchain because larger organization tends to have big workload which is hard for them to shift. Meanwhile, small organization is faster to adopt because they can focus on one issue and they would be more dedicated for blockchain implementation. (P2)
	Sometimes it's very difficult for small companies to adopt certain technology, because they may not have the resources, the money required to build it, to hire the people to get the vendor to build it, and so on. That might be easier for larger organization for resource. On the other hand, a lot of larger organization tend to be less	It might be difficult for small companies to adopt the technology in terms of resources and money to adopt technology. This problem might be easier to be deal with for large organization. However, large organizations might be less innovative and more change resistance (P7)

	innovative, more change resistance, etc	
--	---	--

Source: Author's Analysis

On the other hand, organizational size may influence positively, negatively or both which indicated from Table 4.23. Large organization may have an advantage on bigger resource and revenue than small organizations. Size of organizations could be an asset for organizations in terms of embracing new technologies if they capitalize it right. However, genuinely smaller organizations may move faster because they have less politics than large organizations. In terms of resource, larger organizations that have higher resource is not always beneficial, what matters is the quality of the resource. One of the participant suggested that small size organizations do not have to invest the technology internally, they may use outside partnership which is more efficient because smaller organizations have less money than large organizations which able to make an experimentation easily. In conclusion, organizational size does matter in terms of positive and negative influence or no influence towards intention to adopt blockchain technology. However, the findings indicated that findings from Clohessy and Acton (2019) that said large organization is more likely to adopt blockchain is not a match with the findings here. Both small or large organization has its own advantages and disadvantages. The summary for advantages and disadvantages of small and large organizations is shown on Table 4.24

Table 4.24 Advantages and Disadvantages on Organizational Size

Type	Small Organization	Large Organization
Advantage	1. Less Politics 2. Faster to adopt and adapt with changes	1. High resource 2. Bigger Revenue
Disadvantage	1. Less revenue 2. Less resource	1. Change Resistance 2. More Politics

Source: Author's Analysis

4.1.5.4 Additional Factor

- Business Model Readiness

Business models are inherently exposed to changes such as technologies (Nowiński & Kozma, 2017). Along with the development of technology, the company must also review their business model. Based on Table 4.9 on the first statement, it shows that

company feels that blockchain is not a match with their current business models. On the other hand, interviewee P3 and interviewee P3 found that blockchain technology is convenient with their company needs and business model which shown on Table 4.25

Table 4.25 Analysis on Business Model Readiness (Compatibility)

Category	Statement	Interpretation
Business Model Readiness	So we are a technology startup. From our birth, we affiliate with technology. We only started the company for the sake of technology. So for us, it's not about adopting technology, it's more about building technology	If a company started from the beginning to excel on technology, then their business model is depending on technological innovation. (P3)
	Our business model will not be running without blockchain	The business model is ready from the beginning to adopt blockchain. (P10)

Source: Author's Analysis

Statements from Table 4.25 shows that interviewee P3 and interviewee P10 business model is ready for blockchain technology. This enables them more to adopt blockchain technology. As interviewee P3 and P10 both are the only adopter from all the participant then this is relevant why their business model is fit with blockchain technology. However, organization also cannot enforce their business model with blockchain if blockchain is not suitable with their business model. As stated on Table 4.26, inefficiency might happen if blockchain is applied when a company force to use blockchain to business model that is not ready or unfit with it.

Table 4.26 Analysis on Business Model Readiness

Category	Statement	Interpretation
Business Model Readiness	But sometimes there are people who force the implementation of the "trust" technology which in there it is not applicable and instead the business model become not efficient	Sometimes organization force their business model to use blockchain technology and it resulted on the business model inefficiency. (P6)
	If it not fit, then it would be slower. There has to be an agreement, if you do not need it so do not use it because it is not suitable	If blockchain is not fit with business modelso it might cause a slower process so do not use blockchain if it

		does not match what company needs. (P10)
--	--	--

Source: Author's Analysis

The remaining question is what kind of business model would be applicable with blockchain. This is discussed furtherly on Table 4.27

Table 4.27 Analysis on Types of Blockchain Suitable for Blockchain

Topic	Statement	Interpretation
Types of Business Model suitable with blockchain	To use blockchain, first identify the business model. Do not rush to decide early. For example, in the beginning you decide to use private blockchain and in the end the required one is public blockchain, You have to look again because every blockchain network has the different function.	It is important to identify business model in the beginning to know whether blockchain might fit or not with what company needs. There are many types of blockchain like public blockchain and private blockchain which both have different function and as a business, it is important to analyze which type of blockchain would be suitable. (P9)
	Blockchain is very suitable for business related to legal document and that document is held by many parties. Blockchain is good for those parties to share data in a good and unique way.	Blockchain is suitable for businesses that deal with many documents where the document is held by many parties. (P10)
	Blockchain is suitable for Indonesia because in Indonesia, there are a lot of parties which have huge data but the data is fragmented.	Blockchain is right for use in Indonesia because Indonesia is very broad and has many separate parties in different regions. This means that the data is spread to many parties and makes it ineffective. (P9)
	They can try for the smallest lines of the system they have. That is to say, maybe they can't change their entire platform to use the blockchain. But they can try this part right.	A company has many parts and they can try small line of their business to use blockchain. (P9)
	When two people need trust, it means there is potential that one could cheat. Because every activity done by them must be transparent and both need to have control and that is when trust needed. When trust is needed then blockchain too	Blockchain is suitable to address trust whenever there is possibility of people to cheat from other people because blockchain enables data transparency.

Source: Author's Analysis

Based on Table 4.27, it can be inferred that blockchain is suitable for business affiliated with many legal documents. Indonesia is suitable for blockchain because there are many businesses are spread across various islands in Indonesia and the data is separate so that sometimes there is falsification of data and this causes inefficiencies. Blockchain is suitable for business model that needs trust and works with many partners which requires trust to do the business. Blockchain enables data transparency and every party on the network would have their own control. However, blockchain have several types that may apply differently based on the business model which shown on Table 4.28

Table 4.28 Analysis on Type of Blockchain

Topic	Statement	Interpretation
Blockchain type	Unless it is applied above the public blockchain, the company can cheat because if there is a fraud the customer can check it. Now the customer benefits from that. For companies that public blockchain is less profitable, but for users it is very profitable because it is transparent. Most private blockchain can be profitable when the company b2b collaborates with other companies, it needs trust. Well he can make consortium, so when something changes and something new is confirmed because the server is divided into several servers, the company will not cheat on each other.	When public blockchain applied, customers have many advantage because less fraud might happen because customers can check it every time. Public blockchain is not as profitable as private blockchain for companies. However, private blockchain is profitable for businesses to collaborates with other companies which need trust. It can also be made to consortium so when something changes and something new is confirmed because the server is divided into several servers, the company will not cheat on each other.

Source: Author's Analysis

Table 4.28 indicated different use cases based on type of blockchain. Public blockchain is very beneficial for customers because they can see the company data real time. Private blockchain is suitable for doing business to business collaboration. Lastly, consortium blockchain is suitable for business to business confirming each action to do collaboration. In conclusion, it is important for a company to identify their business model whether their business model or not and they can try small part from their business to use blockchain because not every part of business can use blockchain. So, business model readiness is important for adopting blockchain technology.

4.1.6 Environmental Context

4.1.6.1 Regulatory Environment

According to Clohessy (2018), with the emergence of new technology like blockchain that potentially disrupts an industry, governments will need to review and resolve various related issues such as consumer protection and lack of legislation which is specific to blockchain technology. Supportive regulatory support would ease business on adopting a technology, creating a positive influence which shown on Table 4-29 below:

Table 4.29 Analysis on Regulatory Environment (Positive Influence)

Category	Statement	Interpretation
Regulatory Environment	So how you regulate it, is hugely important to businesses in terms of the enterprise variable to build, longevity of business, survivability.	Regulatory environment is important in terms for organizations to be able to build the business easily, making sure of the sustainability and survivability in the industry. (P2)

Source: Author's Analysis

Based on Table 4.29, it could be inferred that regulatory environment influence positively because a supportive regulatory environment would increase and create interest more for businesses, especially regarding blockchain technology adoption. It also helps on making sure for business to be able to develop business easily and making sure of the sustainability and survivability in industry. However, the slow regulatory environment also creates a negative influence on adopting blockchain which shown on Table 4.30

Table 4.30 Analysis on Regulatory Environment (Negative Influence)

Category	Statement	Interpretation
Regulatory Environment	It probably has a probability to slowing down the adoption innovations in some ways, but on the other hand, it also ensures if it gets used in better way, more sustainable, the more beneficial to the customers in the end instance	Regulation might slow down blockchain adoption because regulator needs to adjust blockchain implementation in order to ensure the sustainability, usage and customer benefit. (P7)

Source: Author's Analysis

Regulators have to be careful too because when they set the limit too high then it will lower the adoption because then the business will be afraid to adopt new technology like

blockchain. Regulation is also potentially slow adoption because regulator needs to adjust on blockchain technology implementation to ensure businesses and consumer businesses but to due minimum use cases of blockchain in Indonesia then regulator would be hard to make a detailed regulation.

Due to the confusion of blockchain and cryptocurrency concepts, blockchain is perceived as forbidden to be used in Indonesia. The truth about whether blockchain is regulated or not is confirmed by three participants as seen on Table 4.31

Table 4.31 Analysis on Regulatory Environment (No Influence)

Category	Statement	Interpretation
Regulatory Environment	So, for blockchain itself, the regulation is not a problem but for cryptocurrency, the regulation is still progressing. The government itself react positively to the technology	Regulation does matter but for blockchain usage there is no involvement of government regulation aside from cryptocurrency. (P6,P8,P9)
	Technologically it is not an influence...However because we use it to protect the financial data so we have to deal with OJK	Blockchain technology itself does not have a problem with regulation but what you do with the technology might matters.

Source: Author's Analysis

From three participant statements, there are policy regarding cryptocurrency regulation. The regulated one is cryptocurrency which arranged on *Peraturan Menteri Perdagangan nomor 99 tahun 2018* concerning General Policy for the Implementation of Crypto Asset Futures Trading. This policy states that cryptocurrency is arranged as a commodity not a payment media. Another policy is *Peraturan Bappebti Nomor 3 tahun 2019* concerning blockchain as commodities can be traded on the Futures Exchange. This shows that government already have concern towards cryptocurrency that might already open up to blockchain technology. According to Table 4.31, there is no problem regarding blockchain technology in Indonesia because it is unregulated and could not be regulated. Technology will keep growing and there is no way government could stop technological evolution. What could be regulated is what kind of things you do with the technology. For example, cryptocurrency which is product of blockchain has something to do with regulation because it is a payment system. The other example is from one participant

statements that use blockchain on the company for protecting financial data which involves many parties and mention security too which why OJK is interfering into their business

4.1.6.2 Market Dynamic

Market dynamic refers to the rapidly changing blockchain technology landscape which makes organization review their business model. This means market dynamic is referring to the external parties or conditions in the market that may supporting or not supporting blockchain technology adoption especially this case is in Indonesia. Indonesia market dynamic of blockchain technology must be different with other country because the regulation, condition and readiness of Indonesia have its own characteristics. This section would discuss whether the market dynamic in Indonesia according to the participant either have positive influence or negative influence towards its adoption. First, Wilkinson (2013) explains that market dynamic is factors which affects supply and demand of products in a market. In this case, the product is blockchain and the market is Indonesia. Table 4.32 would explain about participant opinions regarding blockchain market demand:

Table 4.32 Analysis on Market Demand

Category	Statement	Interpretation
Market Demand	We would study any technology faster when there is a demand... but for now it is still niche market, not getting into mainstream yet.	Blockchain market demand is not yet seen in Indonesia because the market is still niche so company is still not eager to adopt it. (P2)
	If you or your friends and colleagues do not have a challenge that could be solved by blockchain then why would I adopt it for my customer	Blockchain is seen to be unable to solve the problem that customer needs. This becomes a reason why company is not willing to adopt it. (P7)
	Actually user does not need to know about the technology behind it. The thing that they need to know is how to gain benefit with this technology.	Customers does not need to know about how to adopt blockchain technology, they only need to know the benefit from it. (P9)

Source: Author's Analysis

Based on Table 4.32, the visibility of market demand on blockchain technology in Indonesia is not yet seen as it is unable to solve customer problems. The market is still niche because the technology itself is not yet understood massively. However, at the same time, actually customer does not need to know the benefit from the technology. Customer

only need to know how could they get benefit from blockchain. The truth is that there is still lack of knowledge about blockchain in Indonesia since it is still considered as a new and emerging technology. People still misused blockchain and cryptocurrency. It is hard for customers to know blockchain importance and advantages if they did not know about the technology benefit itself. The niche market of blockchain is also caused by the minimum network effect of blockchain which also caused why there is still low awareness and knowledge of blockchain.

Table 4.33 Analysis on Network Effect

Category	Statement	Interpretation
Network Effect	For mass adoption, the parameter depends on network effect. Blockchain is also depends on network effect felt on each people. But now, for example, are people want to move to cryptocurrency? If I want to buy something now but unable to buy with bitcoin that means the network effect is not visible right?	Blockchain depends on network effect for mass adoption. For now, blockchain is still not widely used because people do not feel the value or importance of blockchain. This can be seen with one blockchain application which is bitcoin. Bitcoin is unable to be used as payment which means that people is not using it massively. (P6)

Source: Author's Analysis

Based on Table 4.33, the positive network effect is important to increase blockchain technology adoption. Positive network effect happens when there is a situation where user consumption benefit depends positively on other user that use the same product (Jullien & Sand-Zantman, 2016). This does happen with blockchain technology too. However, the real technology value is seen when it is used by many people and blockchain is still does not get the positive network effect yet. Although the visible network effect has not seen but the changes on technological landscape which has effect on timing does exist which is going to be interpreted on Table 4.34:

Table 4.34 Analysis on Timing

Category	Statement	Interpretation
Timing	For me it is primarily market demand and timing...The market wasn't ready for us two years ago to go around start selling blockchain-based solution, we have to wait for the market to be primed with the understanding of blockchain as a transformation before we go start knocking on our own doors.	Market demand and timing is two important primary things. The market was not as ready as now for getting blockchain based solution. So, as a business, we need to wait until market to have understanding on blockchain technology. (P3)

Source: Author's Analysis

Timing and market demand are two primary things that have to be coordinated. As a business, it is an advantage to know the perfect technological innovation that able to solve customer pain point. The main problem is that not all customer has an adequate knowledge of technology like blockchain. Therefore, business needs to educate people slowly while maturing the technology into more friendly to customers. Another theme emerged from this study regarding market dynamic is competitive environment which is explained on Table 4.3

Table 4.35 Analysis on Competitive Environment

Category	Statement	Interpretation
Competitive Environment	When the competitor sells a new technology, other would be triggered	When competitor keeping up with the new technology then the others would follow. (P1)
	For example, between competitors that look at each other when one has adopted blockchain. But, it is not always affected.	Looking at competitor who already adopt blockchain might influence towards blockchain technology adoption. (P6)

Source: Author's Analysis

The financial sector is said to be the early adopter of blockchain technology (Probst, et al., 2016). Along with blockchain first extensive use on cryptocurrency. It caused hype which makes businesses eager to use this technology in order to win on the business environment. From the participant's statements on Table 4.35, when there is a competitor that use a new technology then other would be triggered to keeping up with this new technology too.

Based on the findings presented here, we can conclude that market dynamics does have a significant influence towards blockchain adoption. This section provides that market dynamic is affected by customer, timing, competitor which is confirmed by Cabage (2014) theory about aspects of market dynamic. It is affect both positively and negatively. Market dynamic affects positively when the right market demand, timing and how the technology would be used to solve problem is identified. In the contrary, market dynamic is also affects negatively in regards of low awareness of blockchain in Indonesia that makes businesses not willing to try this technology because the market is not yet understand and feels the urge to get the benefit of this technology.

4.2 Research Conceptual Model Findings

From the analysis that has been carried out, all the factors mentioned by Clohessy (2018) for the TOE framework are found on the statements mentioned by the respondents. Previous study model has been carried out and explored more for this study. However, due to the different knowledge of blockchain and different backgrounds leads to different combinations of preferences on each factors. Based on that matter, all of the factors have an influence on each participant although the response may vary from positive, negative and no influence.

This study emphasizes the contemporary phenomenon of blockchain technology in Indonesia which had no studies before in Indonesia. This may create a different pattern and outcome from another country. Moreover, there are some new themes emerged from this study. From technological context, there are two factors found consists of availability, maturity and observability; hype and image. From organizational context, one factor is found which is business model readiness.

Hence, this study found the influencing factor which support the Intention to adopt blockchain technology on financial services is summarized on the following framework:

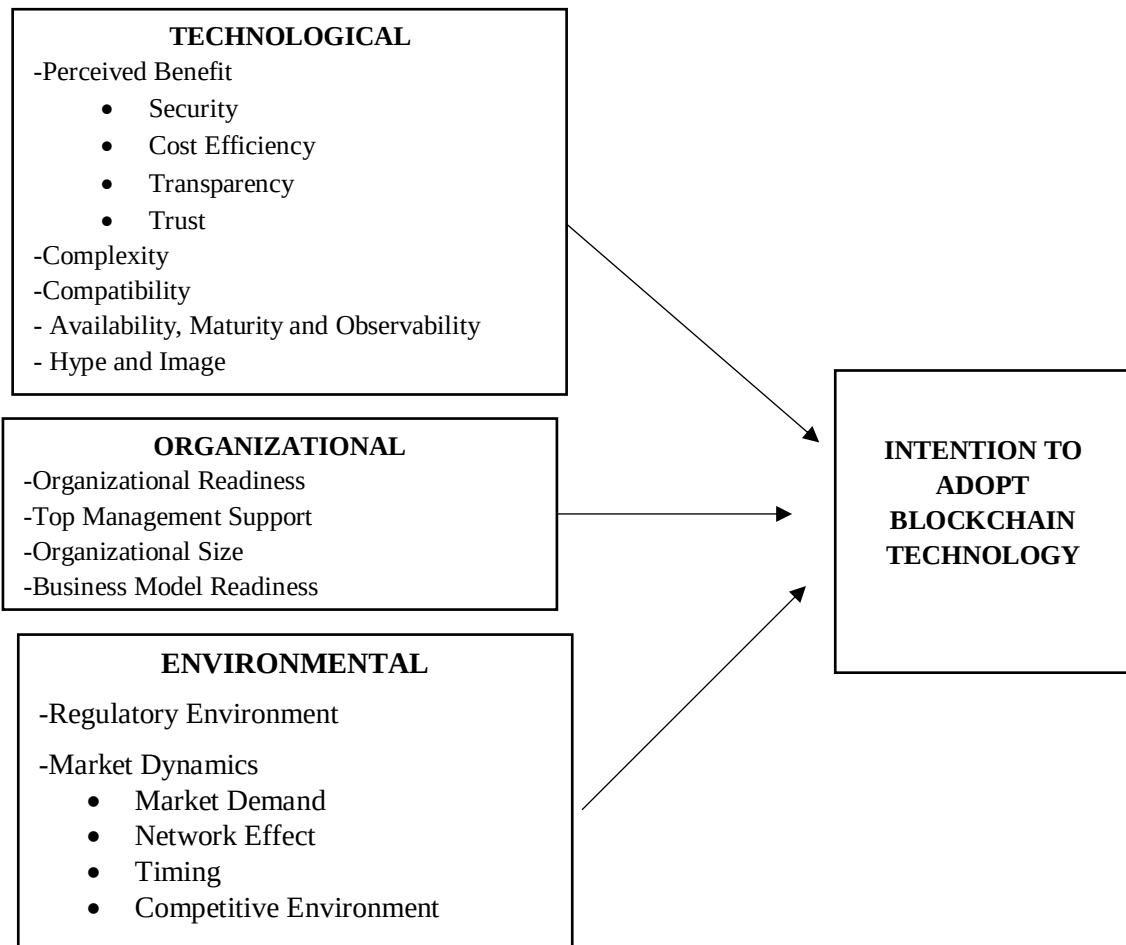


Figure 4-1 Research Findings

[This page is intentionally left blank]

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This research is conducted to find out influencing factors for intention towards adopting blockchain technology or firm level in Indonesia. TOE framework was used for this research as the main concept that would be furtherly explained along the research. This research also aims to fulfill the knowledge gap for blockchain in Indonesia, focusing on clarifying about what factors influence of blockchain adoption and how these factors are influence.

Based on the first research objective, this research aims to explain what is the Technological, Organizational and Environmental factors that influence Indonesia's financial services company on their Intention to adopt Blockchain on their organization. A total of 11 factors found from three contexts. From technological context, a total of 5 factors was found. Perceived benefit, complexity and compatibility factors from the previous model was confirmed and two additional findings consists of availability, maturity and observability; and hype and image are added. From organizational context, a total of 4 factors was found. Organizational readiness, top management support and organizational size from the previous model was confirmed and one additional findings that consist of business model readiness is added. From environmental context, a total of 2 factors was found. Market dynamic and regulatory environment from the previous model was confirmed and no additional findings was found.

Based on the second research objective, this research aims to describe the influence of technological, organizational and environmental factors on Indonesia's financial services company intention to adopt blockchain technology. All of the factors has its own kind of influence whether it would influence positively, negatively, both positively negatively or no influence.

From technological context, perceived benefit mostly considered as a positive influence intention to adopt towards blockchain technology in terms of blockchain security, cost efficiency, transparency and trust. Complexity mostly perceived by the participants to

have no influence because when adopting blockchain because when there is sufficient resource to implement it then it would not be a problem. Compatibility is equally perceived as positive and negative influence according to blockchain relevancy with business needs. Availability, maturity and observability is added to the findings because most participant perceived blockchain still have minimum use cases which make it unobservable and this is resulted from some of participant see the immaturity of blockchain technology. Last, hype and image is added to the findings because some participant is considering or not considering to adopt blockchain because of the technology hype and image.

From organizational context, organizational readiness mostly perceived as a positive influence because when adopting a technology like blockchain, an organization's financial, IT infrastructure and resource must be ready. Top management support is perceived as a positive influence in terms of top management importance as a decision maker which knows more about the company and have more experience on many aspects. Organizational size mostly perceived as a positive and negative influence because both small and large organizations has its own advantages and disadvantages. Business model readiness is added to the model because in order to implement a new technology to the company, the technology has to be fit with the business model of a company.

From environmental context, regulatory environment perceived as a positive influence because supportive regulatory environment does influence towards an organization intention to adopt technological innovation because it is easier for businesses to grow when regulator is supporting. On the other hand, if the regulator is not supporting then it has the probability to slowing down the adoption Based on the findings, for blockchain right now is unregulated and the government is supporting towards its usage. Market dynamic is significantly influence towards blockchain adoption although it is perceived positively and negatively due to the unknown market demand, competitive environment, low network effect and timing. Lastly, no additional finding is added to the research model findings.

5.2 Research Implications

This study results come with implications for both literature reference and practical and managerial of the stakeholder of blockchain technology and financial services, which presented as follows:

5.2.1 Theoretical Implication

This study provides a theoretical framework as a theoretical implication based on TOE framework which implies the factors that affect financial service firms towards their intention towards adopting blockchain technology. This study also gives an additional analysis from each proposed context by Clohessy et al., (2018) on which factors influence positively and negatively for intention to adopt blockchain technology. Therefore, there are a total of 11 factors which support on influencing intention to adopt blockchain technology as a result from this study. There are 2 factors added for technological context and 1 factor added for organizational context. This modified framework can be used for further related study about blockchain technology adoption as literature and reference, which presented on the following figure:

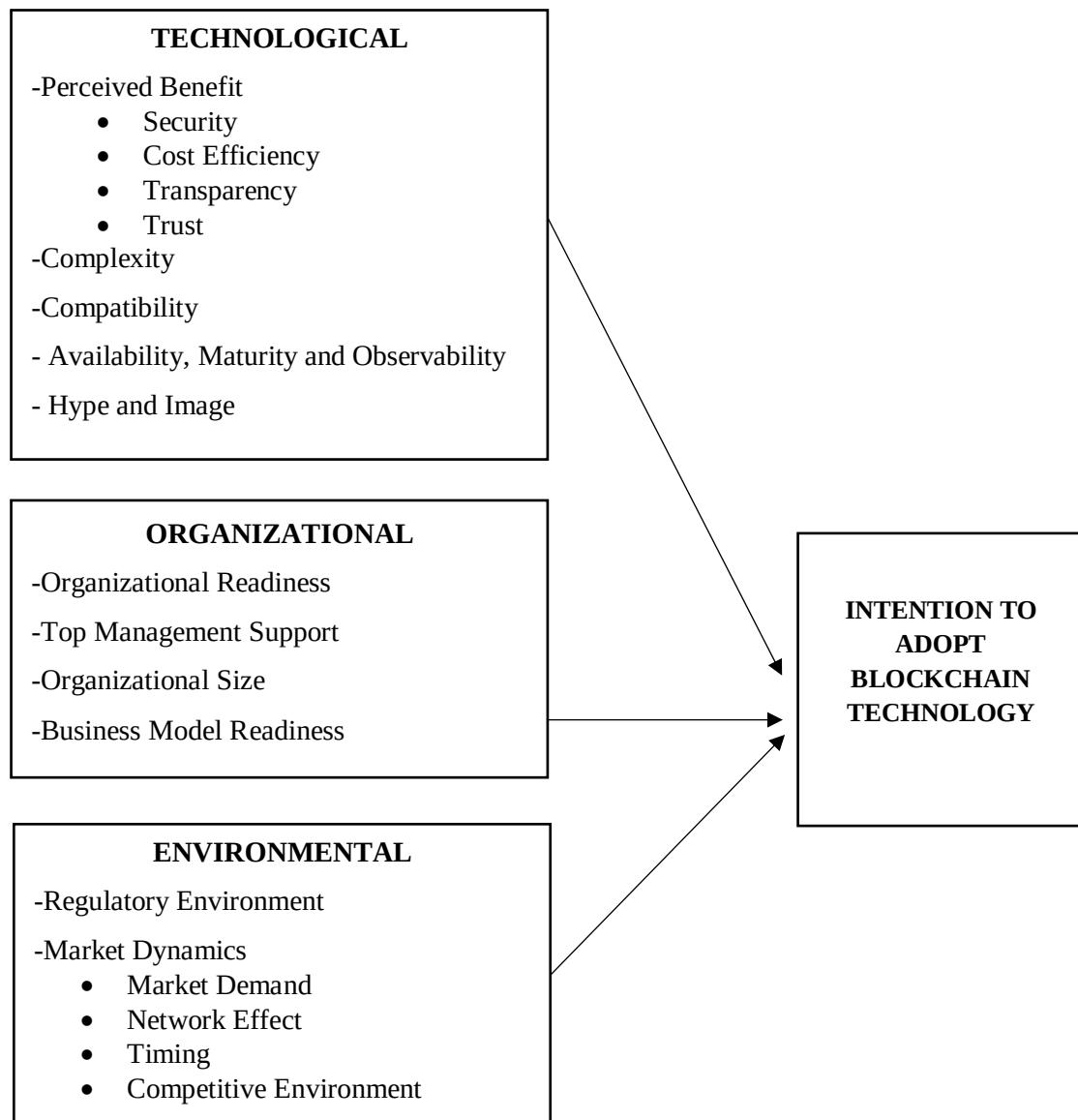


Figure 5.1 Research Findings

5.2.2 Practical and Managerial Implication

1. Financial Services and businesses

For financial services and businesses, this study gives information regarding financial services as a firm and as a business about the important factors that would enable adoption for blockchain technology. This study is also gives indication and information about the technological aspects as the benefit of blockchain and how the technological factors affect the intention of financial services as a business on their intention to adopt blockchain. It also gives an indication on how important is organization role on adopting a technology. Lastly, it describes the current environment condition of Indonesia on blockchain

technology and how the environmental context influences the intention to adopt blockchain technology.

2. Government

For government, this study gives informs government about the current penetration of blockchain technology on financial services which shows that some firms still have a low awareness about blockchain. This study also gives an information about perspective about government role on blockchain technology emergence from financial services. The information can be used to make regulations in order to support the use of blockchain technology.

5.3 Recommendations

1. Financial Services and businesses

Financial services as a business needs to be more willing to innovate and review their business model to adjust with blockchain technology. Blockchain technology may or may not disrupt the business. Therefore, business also need to identify their business model and make sure the problem that they want to solve with blockchain is fit with the technology characteristic. The low education of blockchain indicated that businesses should do more evaluation and study more about the technology use cases. The future of blockchain requires collaboration and that is the main reason why businesses needs to open up and trust each other with and blockchain might be helpful to address this trust issue.

2. Government

This study finds that there is still low awareness regarding blockchain technology usage which indicates that government should play a role to introduce blockchain technology by holding a socialization, events, and blockchain development. Government also needs to be aware of the fast development of blockchain technology use cases because blockchain is potentially disrupting many industries in Indonesia. Therefore, government should be ready to adjust regulation to ease blockchain adoption. Government should also try to apply blockchain technology to some of the instances because government maybe an enabler for increasing the availability and observability of blockchain usage that may increase business awareness on using it.

5.4 Further Studies

From this we recommend that further studies should conduct quantitative studies to determine which factor is the most significant when blockchain technology is started to be adopted on broader level. For further qualitative study it should focus on one context on TOE framework to understand deeper about the implication of the context on intention to adopt blockchain technology. In addition, another qualitative studies focused on blockchain potential on certain industry is recommended because it would give more insights about the implication of blockchain on certain industry and it also gives an indicator whether another industry is potentially ready to implement this technology.

REFERENCES

- ACFE (2019). *REPORT TO THE NATIONS 2018 GLOBAL STUDY ON OCCUPATIONAL FRAUD AND ABUSE*. Asia Pacific Edition. [online] ACFE. Available at:
https://www.acfe.com/uploadedFiles/ACFE_Website/Content/rtn/2018/RTTN-Asia-Pacific-Edition.pdf [Accessed 28 Jun. 2019].
- ACFE Chapter Indonesia (2019). *REPORT TO THE NATIONS 2018 GLOBAL STUDY ON OCCUPATIONAL FRAUD AND ABUSE*. Asia Pacific Edition. [online] ACFE. Available at:
https://www.acfe.com/uploadedFiles/ACFE_Website/Content/rtn/2018/RTTN-Asia-Pacific-Edition.pdf [Accessed 28 Jun. 2019].
- Atlam, H. F. & Wills, G. B., 2018. Technical aspects of Blockchain and IoT. *Advances in Computers*, pp. 1-39.CS
- Antonopoulus, A., 2014. *Mastering Bitcoin: Unlocking Digital Cryptocurrencies*. 1st edition ed. Sebastopol(CA): O'Reilly Media, Inc.
- Arner, D. W., Barberis, J. N. & Buckley, R., 2017. FinTech and RegTech in a Nutshell, and the Future in a Sandbox. *SSRN Electronic Journal*, January, Volume 1, pp. 3-6.
- Arner, D., Barberis, J. & Buckley, R., 2015. The Evolution of Fintech: A New Post-Crisis Paradigm?.
- Asif, Z., & Mandviwalla, M. (2005). Integrating the Supply Chain with RFID: A Technical and Business Analysis. *Communications of the Association for Information Systems*, 15, pp-pp.<https://doi.org/10.17705/1CAIS.01524>
- Attra, C., 2018. *Impact of blockchain on the financial services sector*, s.l.: ey.com.
- Atzori, M., 2015. Blockchain Technology and Decentralized Governance: Is the State Still Necessary?. *SSRN Electronic Journal*, pp. 3-10.

Azure, 2018. *Azure.com*. [Online]

Available

at:

<https://azurecomcdn.azureedge.net/mediahandler/files/resourcefiles/five-ways-blockchain-is-transforming-financial-services/five-ways-blockchain-is-transforming-financial-services.pdf>

[Accessed 19 05 2019].

Baker, J., 2011. The Technology–Organization–Environment Framework . In: *Information Systems Theory*. DOI: 10.1007/978-1-4419-6108-2_12 ed. Hamburg: University of Hamburg.

Bott, J. & Milkau, U., 2016. Towards a framework for the evaluation and design of distributed ledger technology. *Journal of Payments Strategy & Systems*, 10(2), pp. 153-171.

Brown, H. & Kaewkitipong, L., 2009. Relative size and complexity; e-business use in small and medium sized tourism enterprises in Thailand. *Journal of Enterprise Information Management*, Volume 22, pp. 212-231.

Cabage, N. (2014). *Evaluating Market Dynamics with the Startup Scorecard - Mind the Product*. [online] Mind the Product. Available at: <https://www.mindtheproduct.com/2014/08/market-dynamics/> [Accessed 28 Jun. 2019].

Castellanos, S. & Rosenbush, S., 2019. *Reporters Phablet: Here's What's New in EnterpriseTech*. [Online]

Available at: <https://blogs.wsj.com/cio/2019/02/27/reporters-phablet-heres-whats-new-in-enterprise-tech/>

[Accessed 14 April 2019].

Chandra, S. & Kumar, K. N., 2018. EXPLORING FACTORS INFLUENCING ORGANIZATIONAL ADOPTION OF AUGMENTED REALITY IN E-COMMERCE: EMPIRICAL ANALYSIS USING TECHNOLOGY–. *Journal of Electronic Commerce Research*, Volume 9, pp. 237-252.

- Clohessy, T., Acton, T. & Rogers, N., 2018. Blockchain Adoption: Technological, Organisational and Environmental Considerations. In: H. Treiblmaier & R. Beck, eds. *Business Transformation through Blockchain*. Cham: Palgrave Macmillan, pp. 47-76.
- Cohen, D. & Crabtree, B., 2006. *Qualitative Research Guidline Project*. [Online] Available at: <http://www.qualres.org/HomeEval-3664.html>
- Coinvestasi. (2019). *Indonesia Blockchain dan Cryptocurrency Landscape 2019* – Coinvestasi. [online] Available at: <https://coinvestasi.com/featured/indonesia-blockchain-landscape-2019/> [Accessed 28 Jun. 2019].
- Dyulgerova, H., 2019. *How Blockchain Technology will disrupt the Financial industry?*. [Online] Available at: <http://duffy.agency/brandbase/how-blockchain-technology-will-disrupt-the-financial-industry/> [Accessed 19 05 2019].
- Etikan, I., Musa, S. A. & Alkassim, R. S., 2015. Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*, December.
- Ferreira, J. P. M., Gonçalves, M. J. A. & Silva, A. F. d., 2019. A Systematic Literature Review in Blockchain: Benefits and Implications of the Technology for Business. *New Knowledge in information System and Technologies*, pp. 405-414
- Gartner, 2019. *Smarter With Gartner*. [Online] Available at: https://www.gartner.com/smarterwithgartner/swg_ads/top-10-strategic-technology-trends-for-2019/ [Accessed 05 05 2019].
- Grandon, E. (2004). E-Commerce Adoption: Perceptions of Managers/Owners of Small and Medium Sized Firms in Chile. *Communications of the Association for Information Systems*, 13(10.17705/1CAIS.01308).
- Golosova, J. & Romanovs, A., 2018. The Advantages and Disadvantages of the Blockchain Technology.. *IEEE 6th Workshop on Advances in Information, Electronic and Electrical Engineering (AIEEE)*.

- Google and Temasek (2018). *e-Conomy SEA 2018: Southeast Asia's internet economy hits an inflection point*. [online] Singapore: thinkwithgoogle.com. Available at: <https://www.thinkwithgoogle.com/intl/en-apac/tools-resources/research-studies/e-conomy-sea-2018-southeast-asias-internet-economy-hits-inflection-point/> [Accessed 28 Jun. 2019].
- Goscinski, A. and Brock, M. (2010), "Toward dynamic and attribute based publication, discovery and selection for cloud computing", *Future Generation Computer Systems*, Vol. 26, pp. 947-70.
- Gottinger, H.-W., 2016. Innovation, Dynamics of Competition and Market Dynamics. *Archives of Business Research*, February, 4(1), p. 5.
- Gupta, M., 2018. *Blockchain for dummies*. 2nd IBM Limited Edition ed. s.l.:John Wiley & Sons, Inc.
- Gutierrez, A., Boukrami, E. & Lumsden, R., 2015. Technological, organisational and environmental factors influencing managers' decision to adopt cloud computing in the UK.. *Journal of Enterprise Information Management*, pp. 788-807.
- Hall, J. A. 2015. *Information Technology Auditing*. Cengage Learning.
- Halaweh, M., 2012. Integration of Grounded Theory and Case Study: An Exemplary Application from e-Commerce Security Perception Research. *Journal Of Information Technology Theory and Application*, March, 13(1), pp. 31-51.
- Hashim, M., Manzoor, S.R., Kee, D.M.H. and Kazmi, S.S.A. (2016). The New Capitalist Manifesto: Building a Disruptively better Business (Book Review). *International Journal of Academic Research in Business and Social Sciences*, 6(10).
- Hyde, K. F., Ryan, C., & Woodside, A. G. (Eds.). (2012). *Field guide to case study research. tourism, hospitality and Leisure*. Emerald Group Publishing Limited.
- Hype springs eternal. (2016a). *The Economist*. Retrieved from <http://www.economist.com/news/financeand-economics/21695068-distributed-ledgers-are-future-their-advent-will-be-slow-hypesprings>.
- Holotiuk, F. & Moormann, J., 2018. ORGANIZATIONAL ADOPTION OF DIGITAL INNOVATION: THE CASE OF BLOCKCHAIN TECHNOLOGY. *European Conference on Information Systems*, Volume 26.

- Hung, J. L., & Luo, B. (2016). FinTech in Taiwan: a case study of a Bank's strategic planning for an investment in a FinTech company. *Financial Innovation*, 2(1), 1-15. <https://doi.org/10.1186/s40854-016-0037-6>
- Iman, N., 2018. Assessing The Dynamics Of Fintech In Indonesia. *Investment Management and Financial Innovations*, 14(4), pp. 297-303.
- Ito, J., Narula, N. & Ali, R., 2017. *Harvard Business Review*. [Online]
Available at: <https://hbr.org/2017/03/the-blockchain-will-do-to-banks-and-law-firms-what-the-internet-did-to-media>
[Accessed 15 April 2019].
- Iwasaki, K., 2018. Emergence of Fintech Companies in Southeast Asia —Rising Hopes of a Solution to Financial Issues—. *Pacific Business and Industries*, 18(68), pp. 2-33.
- Jaoude, J. A. & Saade, R., 2019. Blockchain Factors for Consumer Acceptance. *The International Journal of Business Management and Technology*, January-February.3(1).
- Karayanni, D.A. (2003). Web-shoppers and non-shoppers: compatibility, relative advantage and demographics. *European Business Review*, 15(3), pp.141–152.
- Karp, N., 2015. Blockchain Technology: The Ultimate Disruption in the Financial System. *U.S Economic Watch*, 10 July.
- Khemtong S & Roberts, L.M. (2006). Adoption of internet and web technology for hotel marketing: A study of Hotel in Thailand. *Journal of business systems, governance and ethics*. Vol.1, No.2
- Koren, S., 2018. *Know Your Customer (KYC)*. [Online]
Available at: <https://blog.neufund.org/know-your-customer-kyc-3c5d32897983>
[Accessed 15 April 2019].
- Kulkarni, U.R., Robles-Flores, J.A. and Popović, A. (2017), “Business intelligence capability: the effect of top management and the mediating roles of user participation and analytical decision-making orientation”, *Journal of the Association for Information Systems*, Vol. 18 No. 7, pp. 516-541.

- Lacovou, Charalambos; Benbasat, Izak; and Dexter, Albert. 1995. "Electronic Data Interchange and Small Organizations: Adoption and Impact of Technology," *MIS Quarterly*, (19: 4).
- Lee, H. & Kim, J., 2007. Determinants of success for application service provider: an empirical test in small businesses. *International Journal of Human-Computer Studies*, 65(9), pp. 796-815.
- Lee, G. and Xia, W. (2006). Organizational size and IT innovation adoption: A meta-analysis. *Information & Management*, 43(8), pp.975-985.
- Lerner, J., 2012. *the Architecture of Innovation*, Boston: Harvard Business Review Press.
- Lippert, Susan K. and Govindarajulu, Chittibabu (2006) "Technological, Organizational, and Environmental Antecedents to Web Services Adoption," *Communications of the IIMA*: Vol. 6 : Iss. 1 , Article 14.
- Low, C., Chen, Y. and Wu, M. (2011). Understanding the determinants of cloud computing adoption. *Industrial Management & Data Systems*, 111(7), pp.1006-1023.
- Maulana, R. (2019). *Tech in Asia Indonesia - Komunitas Online Startup di Asia*. [online] Id.techinasia.com. Available at: <https://id.techinasia.com/perkembangan-tantangan-blockchain> [Accessed 28 Jun. 2019].
- Meidan, A., 1996. *Marketing Financial Services*. Hampshire and London: Macmillan Press Ltd.
- Mendling, J. et al., 2017. *Blockchains for Business Process Management-Challenges and Opportunities*. s.l.:Xiv preprint.
- Mndzebele, N., 2013. The Effects of Relative Advantage, Compatibility and Complexity in the Adoption of EC in the Hotel Industry. *International Journal of Computer and Communication Engineering*, July.2(4).
- Mohamed, H. & Ali, H., 2018. Fintech-Definition, History, and Global Landscape. In: *Blockchain, Fintech, and Islamic Finance: Building the Future in the New Islamic Digital Economy*. Berlin/Boston: Walter de Gruyter Inc.
- Moreno, K., 2014. *Forbes Insight*. [Online]
Available at:
<https://www.forbes.com/sites/forbesinsights/2014/08/12/regulatory-environment-has-more-impact-on-business-than-the-economy-say-u-s->

[ceos/#e4f4284684da](#)

[Accessed 15 April 2019].

- Nowiński, W. & Kozma, M., 2017. How Can Blockchain Technology Disrupt the Existing Business Models?. *Entrepreneurial Business and Economics Review*, September.5(3). Jullien, B. & Sand-Zantman, W., 2016. Network Effects. *Institut D Economie Industrielle*, June.
- Oliveira, T., Thomas, M. & Espadanal, M., 2014. Assessing the determinants of cloud computing adoption: An analysis of the manufacturing and services sectors. *Information & Management* 51, April.pp. 497-510.
- Oosenburg, M. (2018). *Adoption of Blockchain in the Legal Sector*. MSc Business Administration. University of Amsterdam.
- Parasuraman, A. (2000). Technology Readiness Index (Tri). *Journal of Service Research*, 2(4), pp.307–320.
- Patton, M. Q. & Cochran, M., 2002. *A Guide To Using Qualitative Research Methodology*. [Online] Available at: https://evaluation.msf.org/sites/evaluation/files/a_guide_to_using_qualitative_research_methodology.pdf [Accessed 2018].
- Piscini, E., Cotteleer, M. & Holdowsky, J., 2018. *Blockchain : A technical primer*, s.l.: Deloitte Insights.
- Pratap, M., 2018. *Hackernoon*. [Online] Available at: <https://hackernoon.com/how-is-blockchain-revolutionizing-banking-and-financial-markets-9241df07c18b> [Accessed 15 April 2019].
- Premkumar, G. and Roberts, M. (1999). Adoption of new information technologies in rural small businesses. *Omega*, 27(4), pp.467–484.
- Probst, L., Frideres, L., Cambier, B. & Diaz, C. M., 2016. *Blockchain applications & services*, s.l.: European Commission.
- Rahayu, Rita & Day, John. (2015). Determinant Factors of E-commerce Adoption by SMEs in Indonesia. World Conference on Technology and Innovation 2015.

- Riyanto, A., Primiana, I., Yunizar & Azis, Y., 2018. Disruptive Technology: The Phenomenon of FinTech towards Conventional Banking in Indonesia. *IOP Conf. Series: Materials Science and Engineering*, Volume 407.
- Rogers, E. M., 1995. *Diffusions of Innovations*. 4th ed. New York: The New York Press.
- Rogers, E., 2003. *Diffusion of innovation*. 5 ed. New York: Free Press.
- Rogers, E., 2010. *Diffusions of Innovations*. s.l.:Simon and Schuster.
- Sekaran, U., 2002. *Research Methods for Business: A Skill Building Approach (4th Edition)*. s.l.:Wiley.
- Shyamasundar, R. K. & Patil, V. T., 2018. Blockchain: The Revolution in Trust Management. *Proc Indian Natn Sci Acad*, 2 June.
- Simrie, S., Herrington M., Kew J. &Turton N. (2011). Global entrepreneurship Monitor 2011 South Africa. [online] available at <http://www.gemconsortium.org/docs/download/2313> Accessed on 04th June 2019.
- Stieninger, M. & Wagner, G., 2017. Factors influencing the organizational adoption of cloud computing: a survey among cloud workers. *International Journals of Information System and Project Management*, 5(1), pp. 5-23.
- STRAUSS, A. L., & CORBIN, J. M. (1990). *Basics of qualitative research: grounded theory procedures and techniques*. Newbury Park, Calif, Sage Publications.
- Stroud, F., n.d. *Blockchain*. [Online] Available at: <https://www.webopedia.com/TERM/B/blockchain.html>. [Accessed 15 April 2019].
- Sultan, K., Ruhi, U. & Lakhani, R., 2018. CONCEPTUALIZING BLOCKCHAINS: CHARACTERISTICS & APPLICATIONS. *IADIS International Conference Information Systems* , Volume 11, pp. 49-57.
- Tapscott, D., Tapscott, A. & Kirkland, R., 2016. *How Blockchains Could Change the World*. [Online] Available at: <http://www.mckinsey.com/industries/high-tech/our-insights/how-blockchains-could-change-the-world> [Accessed 01 06 2019].

- Taylor-Powell, E. & Renner, M., 2003. *Analyzing Qualitative Data*, s.l.: University of Winconsin.
- Tornatzky, L.G. and Klein, K.J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on Engineering Management*, EM-29(1), pp.28–45.
- Tornatzky LG, Fleischer M (1990) The Processes of Technological Innovation. Lexington, Massachusetts: Lexington Books
- The great chain of being sure about a thing. (2015). The Economist. Retrieved from <http://www.economist.com/news/briefing/21677228-technology-behind-bitcoin-lets-people-who-do-not-know-or-trust-each-other-build-dependable>.
- The trust machine. (2016b). The Economist. Retrieved from <http://www.economist.com/news/leaders/21677198-technology-behind-bitcoin-could-transform-how-economy-works-trust-machine>.
- Tveita, A. & Borander, M., 2018. The Adoption of Blockchain Technology in Norwegian Corporations. *NORWEGIAN SCHOOL OF ECONOMICS*.
- Urbany, J. & Davis, J., 2012. *Growth and Competitive Strategy in 3 Circles*. Notre Dame: Saylor Foundation.
- Van de Weerd, I., Mangula, I. S., and Brinkkemper, S. (2016). Adoption of software as a service in Indonesia: Examining the influence of organisational factors. *Information & Management*, 53(7), 915-928.
- Vishwakarma, P., Khan, Z. & Jain, D. T., 2018. A Brief Study on the Advantages of Blockchain and Distributed Ledger in Financial Transaction Processing. *International Journal of Latest Technology in Engineering, Management & Applied Science (IJLTEMAS)*, 7(1).
- Wang, P. (2009), “Popular concepts beyond organizations: exploring new dimensions of information technology innovations”, *Journal of the Association for Information Systems*, Vol. 10 No. 1, pp. 1-30
- Weiner, B.J. (2009) A Theory of Organizational Readiness for Change. *Implementation Science*, 4, 67. <http://dx.doi.org/10.1186/1748-5908-4-67>

Wilkinson, J., 2013. *strategiccco*. [Online]

Available at: <https://strategiccco.com/market-dynamics/>
[Accessed 5 April 2019].

Woodside, J. M., Augustine, F. K. & Giberson, W., 2017. Blockchain Technology Adoption Status and Strategies. *Journal of International Technology and Information Management*, 26(2).

Yusof, H. et al., 2018. Behavioral Intention to Adopt Blockchain Technology: Viewpoint of the Banking Institutions in Malaysia. *International Journal of Advanced Scientific Research and Management*, 3(10).

Zhu, K., Kraemer, K.L. and Xu, S. (2006). The Process of Innovation Assimilation by Firms in Different Countries: A Technology Diffusion Perspective on E-Business. *Management Science*, 52(10), pp.1557–1576.

APPENDIX

APPENDIX I: INTERVIEW TRANSCRIPT

Participant 1

Role: Director

Financial service type: Non bank payment system

Adoption type: Non-adopter

I	Apa saja yang anda ketahui tentang blockchain?
P	Macem2, mulai itu dipake buat ya macem2. Untuk financial service. blockchain itu distributed ledger, bisa untuk additional security, ya intinya untuk security ya.
I	Kalo di perusahaan sendiri apakah sudah menggunakan Blockchain?
P	Belum.
I	Apakah Anda punya ekspektasi penggunaan Blockchain di perusahaan?
P	Sebenarnya kalo pemanfaatan blockchain itu tergantung kebutuhannya ya. Kalo ngeliat payment industry untuk pake blockchain menurut saya emang ga terlalu ada kebutuhannya ya. Lain kalo financial services yang lain, hmm aku malah bilang kalo financial services itu gak butuh blockchain apalagi traditional financial services ya. Well lain kalo financial services misalnya apa ya.. penerbitan LC, itu kan ngertinya yang disana agreed untuk bayar terus yang disana kirim kalo itu blockchain lebih enak karena gaperlu kirim-kiriman dokumen, semua autorisasinya dan verifikasinya terjadi real time juga. Kalo payment doang sih saya gak liat ada benefitnya ya.
I	Di perusahaan sendiri, teknologi yang digunakan itu kaya gimana mas?
P	Kalo di perusahaan, kita pake teknologi security dan ada juga transaction process tapi ya gak pake Blockchain.
I	Menurut anda apakah Blockchain menarik untuk digunakan?
P	Ohh yaya pasti menarik sih. Blockchain itu sangat penting, untuk kedepan sih penting sih untuk efisiensi.
I	Kalo di perusahaan sendiri berarti belum ya mas?
P	Kayanya nggak
I	Apakah di perusahaan pernah mengevaluasi atau membahas tentang pemanfaatan blockchain di perusahaan?
P	Hmm ya kita sih nge evaluasi pernah kaya ngeliat teknologi ini apa, lalu kemungkinannya apa aja, apa yang bisa kita pake, mungkin ke depan kalo kira2 ada pemanfaatannya ya bisa make. Tapi kalo untuk sekarang dengan skill dan model bisnis yang sekarang ada, kita belum melihat ada kebutuhan untuk itu.
I	Kalo menurut anda, factor teknologikal dari blockchain apakah yang dapat meningkatkan intention untuk mengadopsi di ovo?
P	Well kalo blockchain itu teknologinya ya.. well blockchain itself kan udah technology ya.. well kalo blockchain pasti akan dipake karena pemanfaatannya itu dalam, mungkin kata2nya sama sih yaitu keamanan ya.. jadi verification process for each transaction lebih seamless dan terjamin gitu kan itu satu 1. Terus Speed of transactionnya bisa dipercepat juga. Terus yang ke 3 yaitu dari cost efficiency juga artinya kita bisa spread.. ini lah apa namanya.. gini jadi artinya kita gak perlu di investasi IT dan segalama macem juga lebih rendah karena manfaatin client agents gitu juga.
I	Tapi kalo dari financial service di Indonesia udah banyak yang make belum sih mas?
P	Sampe saat ini hmm aku belum denger banyak yang pake diluar crypto belum denger. Ada bank yg mencoba pake blockchain ini on regional level, ada beberapa sih yang udah coba implementasi, we'll see lah. Target mereka sih di 2020 2021 untuk mulai implementasi.
I	Kalo menurut anda apa sih peran perusahaan dalam meningkatkan inovasi teknologi(blockchain)
P	Perannya sih pasti dari company strategynya ya, mungkin bukan perusahaan ya, lebih ke manajemen ya lebih ke arah kita punya strategi tuh mau apa. Whats our vision as a company? Apakah kita mau leading the technology? Apakah kita mau save guarding the customer? Atau apa?

	Karena setiap arahan itu akan beda. Kalo kita bilang kita mau leading the technology ya kita akan utamakan technology misalkan karena blockchain ini adalah inovasi baru dan pemanfaatannya masih sgt minim di Indonesia. Org aja masih mixed up antara blockchain dan crypto.. artinya kita bisa excelling itu dan pake itunya. Tapi at the same time, apakah teknologi itu tepat untuk model bisnis kita? Itu kan juga well dari ituu sebenarnya peranan dari synergy management, antara strategi dan pilihan teknologi yang ada, apa yang mau kita ambil? Dan kalo memang arahnya,, misalnya nih kalo kita financial servicenya membutuhkan untuk blockchain itu mungkin yang membutuhkan itu kaya peer to peer lending investment lah. The real peer to peer itu mungkin bagus pake blockchain, jadi semua orang bisa langsung tercatat dan record semua contractual agreementnya udah ada disitu. Nah, itu bisa kita implementasiin. Artinya karena kita ini maka kita harus pursue si blockchainnya ini
I	Menurut anda, apakah blockchain teknologi yang rumit?
P	Menurut aku gak terlalu rumit. Well I'm not an IT guy anymore
I	Kalo dari perusahaan sendiri, menanggapi insight dari karyawan apakah hal yang dikonsiderasi juga?
P	Oh iya dong
I	Jadi kalo dari observenya anda, bagaimana sih visibility blockchain ini kedepannya?
P	Visibilitynya pasti gede banget, ya pasti akan gede berkembang dan dipake tapi kapan dan butuh karena.. ya karena sebenarnya blockchain itu teknologi yang gak terlalu rumit.. well bukannya gak terlalu rumit tapi itu kan basically merubah IT infrastructure dan landscape di perusahaan itu. Untuk itu, investasi awalnya kan pasti gede juga. Jadi, perusahaan kecil juga agak susah untuk seperti itu. Perusahaan gede, gak terlalu willing untuk nyoba-nyoba, jadi emang harus ada orang yang IT enthusiast dengan blockchain itu.
I	Top management support ngga tuh?
P	Sangat karena kan ujung2nya kan ya kita kan decision makernya untuk semua hal. Kalo mau ngubah decision suatu perusahaan kan, kita yang decide.
I	Apakah business environment itu bisa meningkatkan influence dalam penggunaan blockchain?
P	Iya, sangat well, untuk beberapa perusahaan ya, tapi yaa beberapa perusahaan lain tergantung. Jadi, kembali lagi ke yang tadi. Apa yang kita jual? Kalo yang kita jual teknologinya, walaupun let's say kaya kmrn ada perusahaan penyedia EDC gitu mereka menyediakan edc, tapi yang mereka jual adalah teknologi. Begitu lawannya itu ngejual teknologi yg baru, mereka jadi panas juga, jadi kaya mereka harus jual yang lebih advance lagi , yang kaya gitu-gitu.
I	Kalau dari pemerintah sendiri apakah sudah mendukung penggunaan blockchain?
P	Hmm pemerintah belum ngeliat ke arah situ sih.
I	Kalo, perusahaan mau adopsi brp lama lg?
P	Dengan pertumbuhan dan product pipe line yang ada di kita, kalo aku sih cuma bisa bilang, di tahun ini sih kita belum liat. Tp kalo nanti produk yg kita kembangkan akan terbantu dengan penggunaan blockchain. Bisa jadi dalam 6 bulan kedepan kita lihat ada product pipeline yang butuh itu, kita bisa menggunakan itu jadi tergantung kebutuhan.
I	Dari t-o-e apa paling penting?
P	Efficiency dan effectivity dan sesuai kebutuhan sih yg paling penting. Jadi sebenarnya financial services kan udah ada teknologinya dari dulu juga, jadi itu lebih mudah untuk implementasi. Kalo misalkan memang ada kebutuhan untuk processing time yang emang membutuhkan dan kita anggap blockchain itu memang solusi yang baik untuk masalah kita ya, ya kita mau. Tp kalo cuma nyoba dan hype , kita sudah tidak di aspek itu lagi

Participant 2

Position: CMO

Financial service type: Non bank payment system

Adoption type: Non-adopter

I	Apa produk dan service dari perusahaan?
P	Kalo yang paling basic itu dia aplikasi untuk pembayaran kaya kalo diluar tu ada service untuk beli voucher game bayar cicilan motor. Cuma cara orangnya bayar itu dia harus top up saldonya cuma bedanya kalo dia kaya e money itu kan bisa ditarik lagi atau ditransfer nah kalo disini gaboleh nah kalo disini beda, kalo dia udah topup itu gabisa ditarik lagi jadi dia gabisa Tarik lagi duitnya nah itu gaboleh soalnya sama BI. Jadi kalo udah topup seolah-olah udah beli produknya beda sama gopay atau ovo yang bisa ditarik jadi duit lagi. Nah jadi kita bikin layanan ada top up nya dan juga terhubung ke rekening koperasi yang ada di bawah perhimpunan pay bmt. Jadi nanti disitu orang bisa cek saldo rekening koperasi, kalo dia gapunya rekening koperasi nah dia tetep bisa connect pake misalnya bank syariah kaya bni syariah. Nah bedanya sama anipay itu kan top up aja tuh, kalo di pay bmt dia bisa connect ke rekening yang ada di koperasi. koperasi mereka yang gede kaya misalnya koperasi beringharjo. Jadi nanti anggotanya anggepannya koperasi-koperasi ini berperan sebagai bank. Bedanya kalo bank itu kan dibawah BI sedangkan kalo koperasi dibawahnya kemenkop. Tapi fungsinya sama. Jadi yang pertama bisa untuk cek saldo, terus transfer antar anggota koperasi. Yang sudah dipersiapkan oleh paybmt ini adalah koperasi sekunder, jadi bisa transfer antar koperasi juga. Koperasi sekunder itu anggotanya bukan manusia tapi koperasi2 juga isinya.
I	Teknologi apa saja yang digunakan di perusahaan?
P	Jadi disitu, oiya tadi ada satu lagi namanya koopling, bedanya kalo koopling itu bedanya dia punya jaringan sendiri dan dia itu semi online. Meanwhile, kalo pay bmt sebenarnya di koperasinya itu udah siap online karena udah kenal sama server jadi dia nanti si pendatanya udah di server. Nah yang menantang itu koopling karena aplikasinya itu primitive istilahnya, pake foxpro nama Bahasa pemogramannya. Uniknya foxpro itu gabisa online. Nah itu pake teknologinya kalo di itu namanya istilahnya switching gateway, istilahnya enterprise service buzz, jadi dia itu melakukan koneksi ke system yang lain, kaya penerjemahan protocol, jadi biasanya kalo bank ada namanya iso 858, kalo diluar itu namanya jaycon. Atau protokolnya khusus kaya di anillo istilahnya proprietary, bikin sendiri dari enkripsinya cara komunikasinya, jadi kita bikin tersendiri.
I	Apakah sudah pernah mendengar tentang blockchain sebelumnya? Dan kalau sudah apa saja yang diketahui tentang blockchain?
P	Oiya jadi blockchain itu kalau di dunia IT sudah terdengar lama terutama awalnya kan dari bitcoin dan ada platform opensource yang namanya ether atau ethereum ya namanya. Nah ternyata dari ethereum itu kan bisa dibikin macem-macam ya darisitu, karena kita berkaitan dgn fintech tentunya hal yang kaya bitcoin itu bisa banget kan kita gunakan untuk menggantikan saldo yang di kartu dengan koin tertentu yang ggada lagi exchange, kalo bitcoin diterima kaya Libra itu kan bisa diconvert antar negara. Nah yang pertama itu kita dengernya dari bitcoin dan mencoba mengaplikasikan bitcoin di koperasi.. eh bukan mencoba tapi baru berangan-angan lah belum kaya coba aplikasi. Yang kedua itu masalah desentralisasi itu menarik karena kalo kaya sekarang itu kan gampang diserang, udah beberapa kali diserang sama hacker lokal lah atau dari cina padahal kita juga bukan siapa-siapa. Nah jadi kalo desentralisasi itu menarik lah karena ya dari sisi securitynya kalo desentralisasi kan costnya boleh jadi turun kalo kita implementasinya turun, kalo yang ketiga itu masalah nya kalo di blockchain itu ada namanya verification ya. Kamu udah tau kan pasti? Ada hashnya ya yang gabisa lari. Masalah data verification ini juga penting karena bisa aja kan tingkat kepercayaannya itu kan naik turun artinya kalo di dunia fintech itu kan trust nomor satu ya jadi misalkan kalo saldo yang ada di server itu gabisa dipercaya terus yaudah orang gabakal make nah ketiga itu ya trust itu karena ada system verifikasinya yang udah built in di blockchain itu.
I	Jadi kalo pengetahuan seputar blockchain yang disebut tadi ya?
P	Iya jadi yang pertama itu keuangan yaitu butcoin yang kedua desentralisasi yang ketiga masalah verifikasinya
I	Apakah anda memiliki ekspektasi dari blockchain untuk perusahaan atau financial sector?

P	Oiya jelas sih ada ya cuman hmm maksudnya teknologi itu pada suatu saat akan menjadi mainstream ya apalagi sekarang facebook kan udah mulai nih ya dengan projectnya Libra. Nah kalo di Indonesia sendiri jg ada contohnya your company. Kalo secara internal perusahaan sih, kita kayanya gaakan bikin sendiri ya untuk blockchain tapi kita justru karena kekuatan perusahaan kita itu ada di switching gateway justru kita akan mengintegrasikan layanan yang ada dengan perusahaan yang fokus di blockchain.
I	Kalo pemanfaatan riil di financial sector yg diliat ?
P	Oh iya jadi kalo koin kan ada macem-macam ya kaya bitcoin. Dulu juga sempet di Pt Pos itu ada yang namanya digiro.in. yang terbaru facebook libra gitu kan jadi kita bisa bertransaksi tanpa peduli batas negara jadi disitu gaada lagi exchange dimana orang itu ya istilahnya apa ya jadi serba nyaman karena borderless ya dank arena desentralisasi gaada yng mengendalikan secara penuh. Kalo sekarang kan uang sangat dikendalikan ya, dicetak oleh negara, kalo yang ini kan bener2 apa ya, bener2 rakyat ya jadi kekuatannya dari orang-orang yang make jadi bukan dipaksa dari institusi tertentu. Contoh kaya the Fed
I	Kalo diluar kripto ada ekspektasi yang diinginkan? Kayamiskan untuk internal
P	Belum sih belum kepikiran
I	Di perusahaan berarti belum adopt ya?
P	Iya belum
I	Apakah menurut anda blockchain akan beneficial untuk perusahaan?
P	Kalo secara langsung mungkin nggak ya karena kita kan bukan developer untuk blockchain nih. Tapi mungkin kita akan mengintegrasikan perusahaan teknologi blockchain dengan klien dari koperasi yang membutuhkan solusi dari blockchain itu gitu kan.
I	Terus, apa alasan dari perusahaan kenapa tidak menggunakan blockchain?
P	Yang pertama kekurangan sumber daya manusia yang fokus di blockchain kan disini juga kan kaya gaungnya belum terlalu terdengar kaya misalkan ada workshop blockchain, seminar blockchain gitu atau sosialisasi yang lain itu gaungnya belum terlalu terdengar, nah kita mesti cari tau gitu. Sebetulnya, teknologi apapun itu akan kita pelajari dengan cepat ketika ada permintaannya gitu. Jadi kan dari sisi client kita ada yang membutuhkan itu biasanya itu akan menjadi insentif yang kuat untuk mempelajari teknologi karena balik lagi itu adalah kebutuhan yang ada di masyarakat. Dengan adanya teknologi itu maka menekan cost operasional, terus mempercepat proses implementasi, mempermudah proses integrasi, nah itu jadinya menjadi insentif yang kuat buat kita untuk memulai teknologi baru. Nah tapi kalo sekarang masih niche market banget belum masuk ke mainstream. Orang juga paham secara umum kalo blockchain itu crypto padahal kita bisa make untuk macem-macam, kaya tracking, voting, sama booking. Booking jadi kaya beli ticket, jadi itu sebenarnya bisa kan diimplementasi untuk tracking barang, booking ticket nah voting juga bisa kan. Nah cuma belum sih, orang itu kan belum aware sama itunya. Sedangkan proses edukasi itu mahal, sebaiknya proses edukasi itu dilakukan oleh pemerintah untuk ngepush teknologi blockchain ini di pelaku bisnis. Nanti pelaku bisnis misalnya akan ngerasa wah ternyata blockchain bagus ini untuk tracking barang. Ketika muncul narasi itu, kita baru merasa punya insentif untuk belajar blockchain gitu kan untuk kita kirim orang untuk eksperimen blockchain, training. Nah kalo sekarang kaya perusahaan kami itu kan jatuhnya sebagai integrator ya jadi bener2 apa yang ada di masyarakat yang dibutuhin sama masyarakat itu apa itu yang kita kejar. Tapi kalo riset teknologi baru sekiranya kebutuhannya belum ada dan kita butuh edukasi ke pelaku bisnis gitu kan yang client2 kita itu berat.
I	Apakah dari perusahaan sendiri pernah mengconsider atau mengevaluasi untuk pemanfaatan blockchain di perusahaan?
P	Ya cuman hanya di top manajemen aja sih. Kita udah pernah kirim dari top management untuk seminar blockchain di Indonesia.
I	Apa sih karakteristik teknologi dari blockchain yang dapat influence perusahaan untuk menggunakan blockchain?
P	Jadi yang sebelumnya ada dua yaitu desentralisasi dan verifikasi.
I	Terus, menurut anda gimana sih blockchain relate dengan current technology sekarang dan dia itu mempunyai kelebihan yang bisa ngeimprove current service dari perusahaan?
P	Balik lagi yang dua tadi. Kita merasa desentralisasi bisa mengurangi cost gitu ya dari pengadaan system dan juga sisi keamanan. Terus lagi yaitu masalah trust ya.
I	Apakah blockchain sulit dimengerti dan digunakan?

P	Terus terang iya sih, konsepnya lebih.. karena juga ya kurangnya sosialisasi ya. Kita itu bisa kan karena baca-baca gitu kan sehingga mencari secara aktif kan, makanya hanya ada di top management aja. Sedangkan, kalo ada di lapangan, sulit untuk mendapat informasi begitu. Ya kan gak diajarin dimana-mana tuh. Emg ada di universitas? Belum kan. Makanya kan kenal sama blockchain itu nggak kan makanya susah kan, ngasih tau aja mesti dari 0 gitu.
I	Apakah hal ini influence?
P	Jelas karena semakin kompleks kan kita harus investasi waktunya, biayanya lebih tinggi untuk training.
I	Berarti influencenya gmn negative ya?
P	Iya negative karena kita nganggepnya ini adalah hal yang sulit untuk diterapkan
I	Terus apakah anda melihat blockchain relevan dan compatible dengan kebutuhan skrg dari perusahaan?
P	Belum sampai tahap itu (no answer)
I	Apa sih menurut anda peran dari organization dalam intention untuk mengadopt blockchain di perusahaan?
P	Belum belum. Hmmm kayanya sih belum ya karena kita masih tahap awal jadi cuma di top management aja.
I	Apakah human resource yang ada di perusahaan, infrastructure dan financial condition dari perusahaan itu berpengaruh terhadap perusahaan dalam meningkatkan intention untuk adopting blockchain?
P	Berkaitan dengan sumber dayanya itu jelas ya karena sekarang ini kita gabisa nge adopsi blockchain itu tanpa kita mentrainingkan orang terus gaada yang kita tau nah kita juga gatau ada orang yang bisa kita hire yang udah jago tinggal jalan, itu silit lah, kalopun ada itupun sangat mahal. Itu cuma startup2 yang udah punya pendana yang bisa melakukan itu. Jadinya memang fokus kesitu. Kalo sekarang ini masih di kendala untuk biaya training itu sih dan juga problem dari customer dari market yang belum ada.
I	Apakah top management support mempengaruhi dalam meningkatkan intention untuk adopt teknologi blockchain di perusahaan?
P	Iya, ya artinya top management ini kan ada banyak faktornya ya, ada ffaktor inancenya, faktor operasionalnya, faktor research teknologinya, business developmentnya. Nah itu kan ada banyak faktor ya. Masing2 dari top management itu mewakili berbagai sector itu. Biasanya dorongan yang paling berhasil itu kalo dari bisnis. Jadi missal bisnis butuh, financenya ada nah yang lain mengikuti. Tapi kalo kebalikannya, yaitu teknologinya dulu yang maju berarti kita kan gambling, apakah teknologi yang kita pelajari ini bisa laku atau nggak. Yang bakal salah itu kalo kaya gitu tentu influencenya itu sangat kuat, artinya gaakan diimplementasikan tanpa persetujuan dari top management yang berarti dari berbagai aspek harus ditinjau terutama dari sisi bisnis.
I	Apakah organizational size mempengaruhi dalam meningkatkan intention untuk adopt teknologi blockchain di perusahaan?
P	Jadi kalo menurutku sih kalo orang mengadopsi blockchain itu hmm sebagai perusahaan teknologi blockchain ya bukan end user itu, kalo end user kan bisa aja kaya logistic terus pake teknologi blockchain. Kalo perusahaan teknologi itu sebaiknya fokus di blockchain karena kompleks dan banyak yang harus dipelajari karena stage yang sekarang itu masih eksperimen kan ya. Nah kita masih di tahap eksperimen dan di seluruh dunia juga masih di eksperimen. Cuman, kalo perusahaan yang existing yang belum pake blockchain terus tbtt pake blockchain itu aku rasa berat gitu karena dia harus maintain banyak teknologi sekaligus dan blockchainnya juga kompleks jadi ya sulit lah. jadi kalo menurutku kalo perusahaan teknologi yang emang mau memberikan solusi blockchain itu dia fokus ke blockchain jadi dari awal dia udah niatnya fokus blockchain atau ya dia pindah fokus dari yang lama jadi ke blockchain aja gitu.
I	Tapi kalo kaya perusahaan yang lebih gede itu apakah lebih potensial?
P	Kalo menurutku, justru jadi oh gini, artinya kalo organisasi yang besar itu dia kan udah punya pekerjaan yang besar nah tbtt dia pindah nah menurutku tuh susah berat. Tapi justru kalo perusahaan yang kecil, dia yang istilahnya bisa fokus gitu ya. Untuk meninggalkan yang sekarang itu fokus atau bener2 dedicated ke blockchain itu bisa gitu. Kalo menurutku besar kecilnya pengaruh. Besar malah lebih susah, kalo kecil kalo malah lebih cepet adopsinya.
I	Menurut anda, dari sisi eksternal atau business environmental mempengaruhi dalam meningkatkan intention untuk adopt teknologi blockchain di perusahaan?

P	Ya karena yang jelas yang pertama harus ada regulasi yang jelas banget dari pemerintah. Kita ambil contoh yang paling sukses kan di singapur. Di singapur itu kan perangkat regulasinya benar-bener lengkap dan detail jadi kita berbicara e-money ajaudah berantakan istilahnya banyak hal-hal yang masih abu2 dan perlu diatur, kaya misalnya pinjaman online, apalagi sekarang kita masuk blockchain gitu ya. Nah kalo gasalah itu bitcoin dilarang kan ya?
I	Iya tapi dia diatur di bapepti dan diakui sebagai commodity
P	Nah iya, waktu pertama kali bitcoin masuk itu dia ditentang kan ya sama menkeu jadi kan istilahnya pelaku bisnis juga apalagi blockchain itu identic sama cryptocurrency. Nah jadinya itu dianggap sesuatu yang terlarang, padahal kan bukan, cryptocurrencynya yang terlarang tapi blockchainnya nggak. Tapi karena itu nempel terasosiasi dengan cryptocurrency jadi orang takut kalo bicara blockchain. Nah jadi edukasinya harus lebih jelas. Nah jadi regulasi itu yang istilahnya bisa menentukan minat dari bisnis, yang kedua itu sosialisasi atau edukasi jadi sebetulnya kita butuh sebagai perusahaan teknologi itu edukasi jadi kita tentunya berharap dari sisi pemerintah itu melakukan sosialisasi atau at least mendukung sosialisasi terkait blockchain ini. Kalo kaya di Malaysia, Singapore itu hampir itu kayanya rutin ada bicara masalah blockchain, workshop technical2. Nah disana yang diundang bukan cuma pelaku teknologi2nya aja tapi juga end user, bukan developernya doang tapi end user juga jadi end user juga paham ohh blockchain tuh kaya gini toh bisa dipake buat gini. Nah kaya kemaren itu udah bagus kemaren ada bekraf ngadain soal blockchain itu erus dijelasin tentang kegunaan blockchain untuk tracking kopi. Itu perlu lebih banyak lagi, mestinya rutin. Kalo kaya kemarin itu kan sekali gede, nah perlu ada diskusi2 lanjutan, focus group, jadi edukasi blockchain terkait end user itu bagus. Jadi yang pertama regulasi yang kedua sosialisasi. Jadi dari segi pemerintah itu. Nah kalo ini udah terjadi itu kan ada sisi environment berikutnya yaitu end user atau pebisnis kan nah pelaku bisnis itu merasa ada kebutuhan tentang blockchain ini. Baru kita bisa bergerak, atau yang ketiganya yaitu ada investasi yang massive. Yang berani bakar duit, disrupt market sehingga masyarakat sadar “wah kita butuh blockchain” nah kalo ada yang mendisrupt gitu pasti yang ngekor banyak, termasuk saya pasti akan ikut juga. Artinya, perlu ada itu sih, pertama regulasi kedua sosialisasi ketiga organic demand yaitu kebutuhan dari perilaku bisnis dan yang keempat itu breakthrough yaitu disruption dari satu penyedia teknologi atau investor atau startup yang punya investor gede yang mau bakar duit jadi dia mendisrupt market sehingga tbth pelaku bisnisnya sadar oh iya kita butuh blockchain gitu.
I	Kalo dari market dynamic, kaya competitor, landcape market?
P	Berpengaruh
I	Kalo dr semua itu yang paling pengaruh apa?
P	Kalo kita yang paling penting justru eksternalnya dulu gitu. Dari marketnya dulu, kuncinya itu kalo ada demand maka ada supply.

Participant 3

Position: Chief Executive Officer
 Financial service type: Peer to Peer Lending
 Adoption type: Adopter

I	Can you describe Your company?
P	Your company is a blockchain platform for issuing Islamic and social impact security which that means that our platform is technology that helps project or companies that are making social impact to raise money in the capital markets.
I	What kind of product or service do Your company primarily sells?
P	So, it depends who you are. If you are an investor then we offer an investment platform where you can sign up and you can register using your mobile phone and then we list the investments you can choose from, so you can choose the investment that suit your personal goals or objective as an investor. And in exchange for that, we take off your profit that you are generated. So, if you are an investor, we don't charge you a fee upfront or charge you a certain percentage of money. Rather, we only make money when you make money. So, when you make a profit, then we take a piece of that profit. If you are a financial institution, we have a software as a service (SaaS) platform where you can choose to broaden your reach from your products and services using blockchain technology. For example, we working with asset managers who manage equity funds for mutual funds to tokenize those funds and much more. Broadly speaking, if you are an institution we have a SaaS.
I	Does your company already adopt Blockchain since the beginning?
P	Correct, so we begin with a thesis "broadening the reach of Islamic financial services using technology". It took a while for the technology to be mature enough for us to deploy it fully 100% but since day 1 we have been using blockchain technology.
I	How would you describe your knowledge about blockchain?
P	My knowledge about blockchain is mostly focused on the essential operation of blockchain, how it works both conceptually and technically and as well as the application of blockchain which is my specialization. I am not an engineer who would type the blockchain but if you need to I can type a reference of client who can break a blockchain like a wallet for example. So, in terms of expertise and my knowledge of Blockchain, I think I know technical enough to know how to do anything with it. I'm really focusing on the application of blockchain.
I	What are the other application that you know about blockchain in financial industry?
P	We use the ethereum blockchain. When we first started, we use bitcoin. Bitcoin is the first application of Blockchain ever created. Bitcoin is system of currency and payment, network of payment. We basically use network of bitcoin to transfer money to Indonesia to make microfinance investments. So following on the bitcoin, ethereum was created to be sort of general computer on the blockchain, basically computer on blockchain. But instead of computer that you have on your pocket or on your desk, it is the computer that distributed. Ethereum supports writing that calles "smart contracts" which are basically just a computer program. So it is the same is you make an app and you put it on the appstore, an ethereum blockchain supports what are called "DApps" or "smart contracts" that basically are just software programs that run on the blockchain. Other examples include things like a Lunar and Stellar and Ripple which are they're basically are statement protocols, so they're designed for institutions like Banks to settle balances of trade and payments using sort of net settlements and market maker model where today when you set an international payments typically the way it work that goes to a swift network (7.10) which is a US company that owns a swift network and the way it works is when you are a Bank and you want to join that system you needs to deposit hundreds or thousands or millions of millions of dollars in the federal bank of New York City. You have to deposit money to the federal banks in New York. The problem with that is that exposes you to censorship or financial censorship. So for example if US mad at Indonesia, US can put Indonesia to greylist or blacklist and that would prohibit anyone from sending money to Indonesia. It happens because this system is used by everyone so they're forced to do this. For example, Singapore had no business with US but they prohibited to send money to IRAN. However they have to send or transfer money and that money is put to the swift system. So when they about to send money it can be seen by the swift system. US can fine them

	with hundreds millions of dollars. So, even though they're not US company or doing business with US company, they were basically financially censored for sending money to IRAN because US does not have good political relationship with IRAN. Blockchain based system like Ripple, Lunar, Stellar those are alternative system designed to make payment between financial institutions that could be very easy. You could also use another blockchain like altcoin (alternative coin). You can categorize blockchain into payment system with a currency, something that supports smart contract and other type of settlements like LUNAR, STELLAR.
I	Main reason blockchain your company use blockchain
P	In Islamic finance system for capital market in general. So Capital market in Islamic finance are very inefficient today because they were designed for large institutions. If you're the central bank of Indonesia, typically when you raise money, you raise about multiple billions dollars of money at a time for issuing a sukuk. Sukuk is like a stock, but instead of trading shares on a company, you're trading finance in financing deal. So, Bank in Indonesia wants to raise money, it offers some deals to public to invest and then that investment could be traded like a stock. It is really the main capital market tool that available. Capital market is basically place or people who need money go and people who have money go to give the money to people who need it. It connects deals. So that system works fine if you're trading billion dollars of money but that ecosystem has multiple financial intermediaries that charge a lot of money like hundreds of thousands of dollars per year per deal. So, the cost exceeds quickly and even the lawyer paid millions of dollar per deal but it's okay since the deal is big too. But, if you're Muhammadiyah or NU who wants to build a hospital that would cost 50 million US dollar. It would be costly if you need to pay millions of dollar for fees. A lot of function like calculating the amount that needs to be paid to the investor, registering the ownership of the investments like a stock, facilitating the trade of the certificate, those type of facilities or service can be easily done inside a blockchain application using smart contract. So the rules of the financing instrument or Sukuk can be programmed inside the blockchain. And once they are, they're executed automatically for small fee for people that running the blockchain. That million dollars per year can be reduced even to 0 dollars per year for fee. We believe that this open up for Sukuk as an instrument as capital market tool to a whole new ecosystem for smaller issuers who want to raise money like Muhammadiyah, NU and many other institution in Indonesia or Middle east that can raise money with any amount. We see blockchain as removing the inefficiency present in financial services Islamic especially financial market as the main thing.
I	Difference between permissioned and permissionless blockchain
P	An example of permissionless blockchain is like Ethereum which we use. Anyone can join the ethereum network and become the miner, use the money, use the Ethereum. However, within private blockchain or permissioned probably would be like let's say all the banks in Indonesia makes a private consortium where only Banks in Indonesia could join the network. There is a use case for both, however, if you only have a very small number of people in your blockchain, it does not really have any advantage because the value of the security of blockchain comes when you have a group of people who fundamentally do not trust each other but through the mathematics of Blockchain are able to trust each other because of an economic incentive or penalty, that is what cryptocurrency is. And in the end of the day, cryptocurrency is a way to enforce an economic penalty on the bad behavior. People who mainly said I believe in blockchain but not cryptocurrency, basically says that I believe in a good democracy and good laws with no police. The cryptocurrency is the penalty or the incentive to do the good behavior and to not do the bad behavior. Sometimes you might hear, a few or example three institution made their own blockchain, it's basically just a database. It offers some small advantage, but it is not really what blockchain is. It does not have additional security that the economy imposes. The reason Ethereum, bitcoin, and other blockchain is so successful is because they are able to set up a system where by playing the good rules by doing good things in a good way that benefits everyone then you make money, and if you try to cheat then you lose money and that's why permissionless blockchain are so successful and much more secure than doing a database. However, in permissionless blockchain, you can add a level of permission. What do I mean by that? For example, before you remember that smart contract is just a program runs in the blockchain. So, the way blockchain works is, everyone has their own address known as a wallet. So, people can send money to your program, they can interact with your program, just like you press a button on your phone, it does something. Same thing in the Blockchain, but the way you interact with it is from a wallet. Now you can put in your program, only a list of people can use the application which called the "white list". So, you

	can build level of permission into your application. For example, this is what we do today, only customers who have did the KYC or know your customer process and have given us a proper identification or documents, issued by governments, can interact with our investment. Another example is the tradability of an investment. So, in Sharia, some investments are recognized as tradable and some are not tradable. And also there is some conditions about tradability. So, one product example is like the hospital construction like what I mentioned before. The way it works is investors give their money to someone to build a hospital to build the building. Once the building is completed, then the building becomes the asset for the investor. And then the investor lease the building to the original owner of the project. So, the investor makes money with lease or sewa. In Sharia, to be Sharia compliant, the investors cannot trade that Sukuk until the building is finished because until you have the asset you cannot trade it. In sharia you cannot but in conventional you can. So, in terms the level of permission, trading of our Sukuk using our technology, we enforce who can trade and who cannot trade. Because another example of rule in the US, it is not related with Sharia, but in US, investors from the US cannot trade our Sukuk because of US security's rule. So, these are the examples on permissionless blockchain, you can add levels of permission.
I	In what way does blockchain mostly benefited your company and your customers?
P	I'll give you two ways. So, the first is the efficiency. We're replacing a million dollars' worth legacy technology intermediaries with blockchain. It's a huge benefit there. And second is umm I'll give you three actually. Second is transparency. So, if investors are investing in one of our Sukuk, they can see how much money that have been raised in total. It's in the blockchain. It's very clear. And also they can see things like what's the trading volume, how much of this token can be traded in any given day and any given quarter. And the third is interoperability. For example you can connect to wifi anywhere in the world because wifi is a global standard, independent global share of standard. There is no government that force people to use wifi. People use it because it is a global standard and experts says it's the best standard too. For example, when you use ERC 20 which is an ethereum standard for assets. If you use that then the asset can be moved anywhere. You can put that in a wallet, you can put them on the secondary exchange, you can trade them on the secondary market, you can sell them to your friend, you can sell them to a company, those assets can moved around the world freely. In the same way, in the old days, less than 60 years ago, when a ship came to the dock and then they unload the ship, they can take almost a month to unload. Why? Because every different commodity has to be carried or push or wield independently in a unique way. Some unloaded with the crane or some with barrels but the introduction of a very small simple technology revolutionize global logistics and that technology is a box. So in term model freight is basically just a box or a container, it's always the same size. Well there's several different size, but a standard size. So it seems it such a simple idea, just make it the same box, a metal box, it can go on a ship, it can go on a train, truck, in factory, in a warehouse. So that simple idea to standardize something revolutionize the whole global economy. It turn the world into a really global economy. And that is the same benefit that blockchain is having on financial services and assets where every asset is a standard container, so that asset can be move around freely. It can go across borders into a different country and jurisdictions easily. It can be held within different companies that manage your assets for you or you can take it for yourself and deliver it to your own wallet. So that is one of the huge benefit that blockchain and standards like ERC 20 are going to totally transform global finance from the way it is today towards to very segmented and bespoke and takes a long time also inefficient to a world like container shipping where ships move all around the world with just a boxes from the same size. What's inside that box can be completely different and that has totally transform the world and made the world the cost of product and services are much lower and accessible to people all over the world where someone in rural province in Indonesia can get a smartphone made in china, you can get textile in Bangladesh, and this is really amazing, this is what blockchain able to do for financial assets.
I	How long blockchain going to be something common in Indonesia?
P	In a lot of ways, it is already common. Today on Indonesia there are more investors registered on INDODAX which is the largest cryptocurrency exchange. I think for it become as common as wifi like comfortable with it(to download cyptocurrency wallet) about 5 years maybe.
I	What is the significant factors that influence your company to use blockchain?
P	So, the main thing is we want to increase the availability of financial service by making the financial services more efficient using technology. So we were looking for an opportunity to make things more efficient. One of the opportunity I found was on microfinance for example, bringing

	money from outside Indonesia into Indonesia to help microfinance. Blockchain is a good way to move money internationally. Indonesia have a good cryptocurrency market, it's good to use in Indonesia. That's one factor. The other factors are technical, we needed a technology that supports smart contracts, which I mentioned. We needed liquidity. We needed a technology where the software tools to develop application for the technology were available and mature. So those are the main guiding factor why I was settle for ethereum technology. It was really about offering efficiency. We needed the smart contract, we need good tooling, we needed liquidity. Those are the main factors. And we also need active community. We believe we'll be around for 30-40 years. At least 10 years.
I	What do you think about technological characteristics that affect your decision on adopting blockchain on your company?
P	It's global standard. The concept I've mentioned before about the container and the shipping. It makes thing more efficient. That's why its technically valuable for us.
I	What is the organizational factor that influence you to choose blockchain for your company?
P	Well, so we are a technology startups. From our birth, we affiliate with technology. We only started the company for the sake of technology. So for us, it's not about adopting technology, it's more about building technology. I think this question is not suitable for us. This question is more suitable for an existing organization that adopt technology. But I can give you some insights here. So like I said, we work with financial institutions. So, generally speaking, typically when we go to the bank or organization, we try to start approach the CEO. If we don't have the direct connection to the CEO, we put down that from our priority list. Because having direct top executive support is absolutely critical for adoption of a technology. So, one problem in institutions and organizations that are not peered technology. For example a bank, banks typically have an IT team or technology team. One problem is, if you come with an outside technology, it becomes sort of a threat to the technology team, because they did not invent it or build it. So, they're often threatened and the fact that this is not something invented by their team and they may perceived it as a threat. So often times like the head of IT , anytime there is a new technology especially build outside, they'll say we don't need this, we can do this ourselves, we can build this ourselves. Because they perceived as if there is something out there is better than it means whether their budget gets smaller. So, having top management support is absolutely critical. When I say top, I mean C-level at the very minimum, CEO or someone close to the CEO. And you have to balance that about the internal conflict that invented here and outside and how its perceived by the internal technology teams.
I	Size of organization?
P	Sure, I think for example like banks. Banks that are too small probably don't have the resource to embark blockchain projects. So, the size can be an asset for them in terms on embracing new technologies, they have their capitalize right. However, genuinely smaller organization can move faster. For example, we were working with a medium size bank in south of middle east, because they are not so big, there is less politics. So smaller size organization can be less politics, faster adoption but they can also mean less resources. So, I think, what are we seeing, in our case, the outside partnership for medium and small size organizations is great because they don't have to invest internally, they just take the technology and use it, they just sign on the bottom line. Versus larger institutions that may have higher resources to do experimentation internally which small and medium organizations don't have.
I	How about organizational readiness?
P	Yes absolutely. You have to have smart people, people willing to embrace change. I think here's the thing, there is a lot of hype around blockchain. There is a lot of charlatans?, people who are selling you which we called by snake oil in English, people who selling you just bogus products. You need people who build value for your organizations, genuine value and willing to find that value wherever it might be. If you have those types of people, you can blockchain adoption. It may make sense for every stage of a company. But if you have those types of people, how can you drive from the bottom line, either by growing into new businesses or making a company to more efficient, as long as you have people who want to build a genuine value, it can help. That's the main thing. If you have people who showing up every day to punch the clock and shuffle papers around, those types of people are going to be barriers to blockchain adoption, very well maybe blockchain are going to replacing the guy who just gives paper from A to B, so, there will be job function that are

	no longer necessary because of the added value from the efficiency of the technology. That means the things required active thinking, critical decision making, etc
I	How long and what process does your company through when adopting blockchain?
P	Starting October 2014 when we were founded, we want to use smart contracts that were not ready yet. People talking about it, the idea existed but the technology wasn't ready. So 2015, we did some trials using bitcoin. 2016 the technology was ready to be started for research and development. 2017 the technology was pretty much ready and on 2018 we announce the technology and now we active commercialize the technology. So it takes about 3.5 years or 3 years
I	How do you think business environment factors influence your company on adopting blockchain?
P	I would say that the thing that shape us the most is market demand and timing. Let me give you a concrete example. 3 years ago I was in dubai and spoke in a conference called the global Islamic economic conference and my panel had to do something with blockchain and cryptocurrency. Basically 60% of people had never heard about cryptocurrency. The other 35% were skeptical and thinking cryptocurrency is a scam and never go anywhere. There's last year when I was there on October for the same conference and every single session mentioned blockchain and cryptocurrency. 95% of people have heard about blockchain and cryptocurrency and probably 90% people understand about blockchain plays an important role on Islamic finance. So that's shows you the transformation of the environment over this periods of two years. So for us, think about from our business to business (b2b) side, the market wasn't ready for us two years ago to go around start selling blockchain-based solution, we have to wait for the market to be primed with the understanding of blockchain as a transformation before we go start knocking on our own doors. The market is absolutely critical. Another important one is regulatory environment. Blockchain cryptocurrency are a huge topic at all, whether it is ministry of finance, commercial bank, OJK, financial services authority. So, all of them are doing with cryptocurrency. Some people are working on that space, that was not the case 2 years ago. So how you regulate it, is hugely important to businesses in terms of the enterprise variable to build, longevity of business, survivability. So, again, market had to be primed for that too for the commissions to be ready for us to go live commercially.
I	How do you think about Indonesia's regulation? Is it ready for blockchain?
P	Umm... in some ways yes, in some ways no So, first of all, Indonesia is much better than many countries because Indonesia has cryptocurrency regulation since February of this year. The trading of cryptocurrency is regulated under OJK. And they have licensing for cryptocurrency exchange. So that's fantastic and I commend/ comment OJK for that, that is ahead of many countries. However, the regulation is incredibly difficult to comply with. The capital requirements are thousand times money required needed than when you need to start a bank in Indonesia. Being a cryptocurrency exchange, 7000 times more difficult than becoming a bank in Indonesia. I think that is excessive. The other thing that really concerns me is in the regulation if you read it, one of the provision is as a trader of cryptocurrency, you only allow to sign up on one exchange which I think is a terrible idea. And the rationale for this is not explained yet to my knowledge. Because if you can only sign up for one exchange, there will be pricing mismatches, because in finance, if there's exchange A and exchange B, exchange A is more expensive and exchange B is less expensive. What will people do? They open account on both and they arbitrage the price. Do you know arbitrage? So, if the price is more expensive in A and less expensive in B, I go to B. it is like jastip. It's basically jastip with financial assets. So, I go to B, I buy the cryptocurrency and then I go to A and I sell it with higher price, and the fee of moving the money in the middle by the small fee. So, I make money by buying at B and selling to A. why is this good? It is good because it stabilizes the price, it matures the market. But, OJK had said no you cannot. If you sign up at B, you only able to buy at B. so, what will people need to do basically? I just had this idea now. I just want to get it out. People will make a company and sign up with B as a trader, and make a second company and sign up with A as a trader. Then those two companies will just sell in between. So, it's one company at A and B, but actually it's the same owners. I just found this solution.
I	What is the challenge or obstacle when adopting blockchain?
P	So, regulatory of course. In a lot of places it's regulatory uncertainty. Usually it's the case whether isn't regulation that's where it's more difficult, that's the uncertainty. You don't want to invest a lot of money that is uncertain. You want more certainty.

	Also the technology is hard. It takes time to learn the technology, it takes time to build processes and systems of security and that's hard. Security is really important one and it is very difficult.
I	So from the three context from technological, organizational and environmental, what do you think is the most important factor that able to influence your company to use blockchain?
P	I would say it's environmental, technological and organizational (urutan). So, the thing is that organizational, if there's a will then you can always work for it. Everything's inside organization is under your control, if you're the CEO then you can change it. But environmental is outside your control, then technological it's partially under your control, but organizational is fully under your control.

Participant 4

Role: Executive Vice President
 Financial service type: Conventional Bank
 Adoption type: Adopter

P	Jadi misalnya gini perusahaan itu punya beberapa bagian. Kalo misalkan ini nih kita beli barang nih kaya mobil nih, kan dari tiap2 bagian tuh pasti butuh mobil kan. Terus misalkan belinya xenia nih, perusahaan ini kan gede cabangnya ada 2500an misal, taro misalkan satu cabang ada 2 mobil berarti kita kan order 5000 mobil pasti kan harganya jg jatuh krn kita beli banyak dan bagian2 perusahaan itu jg butuh mobil. Terus misal beli computer juga kan banyak banget nah speknya kita samakan dulu dan dapet harga misal 7.5-8 juta, terus misalkan ada satu bagian yg beli 9 juta nah dgn blockchain ini kita bisa tau kalo ada perbedaan data. Jadi awalnya itu ya dari leadernya. Begitu leadernya mau ya semua dipaksa buat adopsi ini. Oiya adalagi yang masalah data, nah data itu misalnya masalah sisduk (sistem kependudukan). Jadi perusahaan dapat otorisasi melihat data penduduk untuk otoritas kredit. Jadi dia pernah punya utang apa dll itu bisa liat untuk prey checking. Nah itu mesti di assess ke OJK juga. Nah kita jg harus pake sisduk untuk departemen luar negeri.
I	Teknologi apa saja yang sudah di implementasikan di perusahaan?
P	Tagihan kartu kredit otomatis, bank online dan masih banyak lagi pasti ada di Perusahaan. Belum lagi Sistem internal kepegawaian kita pakai SAP dan masih banyak lagi
I	Jadi apakah perusahaan sudah menggunakan blockchain pak?
P	Sudah, pada bagian pembelian dan data base, checking background kredit (data kependudukan)
I	Siapa saja yang mempunyai akses ke system blockchain tersebut?
P	Tergantung otorisasinya, kalau ternyata butuh approval yang lebih tinggi maka approval jabatannya lebih tinggi. Misal gini kan ada direktur, ada head apa, ada staff. Misalkan gampangnya teller nih handle transaksi 5 juta kalo lebih berarti diatas lagi.
I	Kalau di bagian bank sekuritas sudah memakai blockchain kah pak?
P	Kalau tidak salah untuk integrase data dengan bursa efek
I	Teknologi apa saja yang sudah di implementasikan di perusahaan?
P	Tagihan kartu kredit otomatis, bank online dan masih banyak lagi pasti ada di Bank. Belum lagi Sistem internal kepegawaian kita pakai SAP dan masih banyak lagi
I	Jadi apakah bank sudah menggunakan blockchain pak?
P	Sudah, pada bagian pembelian dan checking background kredit
I	Siapa saja yang mempunyai akses ke system blockchain tersebut?
P	Tergantung otorisasinya, kalau ternyata butuh approval yang lebih tinggi maka approval jabatannya lebih tinggi.
I	Kalau di bagian bank sekuritas sudah memakai blockchain kah pak?
P	Kalau tidak salah untuk integrase data dengan bursa efek
I	Menurut bapak apa yang membuat blockchain menarik untuk diterapkan di perusahaan?
P	Reduce cost dan cepat dan bisa digunakan untuk beberapa analisa. Seperti contohnya berapa banyak sih cabang yang memiliki supply mobil paling banyak dan kenapa? Ambil contoh bali dan jogja, kalo cabang sini biasanya 5 nah disana itu bisa 20. Setelah dianalisis ternyata Bali adalah tempat wisata yang sering didatangi tim dari Perusahaan dan misal OJK datang itu karena di analisis setelahnya. Selain itu bisa analisa untuk kedepannya mau bagaimana. Selain itu juga integrase data dengan bursaafek, itu bisa dibuat analisa kajian nya.
I	Apakah terdapat ekspektasi dari bapak dari pemanfaatan blockchain?
P	Bagaimana bisa lebih cepat, bagaimana bisa lebih murah dan analisis, dengan nada blockchain inginnya ada improvement yam akin cepet makin murah
I	Problem apa menurut bapak yang paling baik untuk diselesaikan pada financial industry dengan blockchain?

P	Intinya gini dengan adanya blockchain kan pasti efisien, lebih mudah, lebih cepat dan ngurangin orang. ...Inefficiency dari semua proses yang membutuhkan banyak orang dan perantara, biar proses semakin cepat dan semakin murah dan mengurangi orang. Efeknya gini jadi dulu perusahaan tu banyak banget cabang nah sekarang kan nggak karena ya udah ke handle dari yang digital. Cabang2 itu banyaknya di luar daerah kaya papua karena kadang susah untuk jangkau secara digital sama di Jakarta itu di pondok indah karena isinya orang tua2 yang kaya2. Kalo cabang yg di tengah kota itu ya cukup digital.
I	Apa factor yang paling significant yang membuat perusahaan menggunakan blockchain? Dari segi technology
P	Jadi seperti ini, blockchain ini kan teknologi terdepan, akan tetapi ada keterbatasan biaya yang harus dikeluarkan tentunya. Contohnya di perusahaan ekarang pake SAP, banyak versinya dan lisensinya makin baru makin mahal. Kita baru selesai implementasi SAP versi 4 misalkan, ternyata sudah keluar versi 6, jadi susah dan kadang ada pertimbangan apakah kita harus investasi di versi terbaru juga? Dari segi finansial juga di pertimbangkan. Biaya investasi untuk IT itu kalo computer itu amortisasinya ada yang 3 tahun dan 5 tahun. Kalau belum segitu amortisasi sementara system sudah semakin update kan berarti kita ketinggalan sementara dalam hitungan finansial belum harus ganti. Nah susahnya disitu antara kecepatan kemampuan secara finansial dan kecepatan technology yang tidak seimbang. Itu yang rada susah dari implementasi teknologi. Teknologi kana da macem2 dan kita kan kadang duitnya gak ada. Dan kalau ketinggalan system kita disbanding perkembangan dan system yang ada di masyarakat, Bahasa lainnya system kita tidak laku, karena juga untuk ganti system atau update itu tidak secepat dan semudah itu.
I	Menurut bapak apasih peran organisasi dalam mengadopsi blockchain sebagai technology dan inovasi di Mandiri?
P	Organisasi pasti sistemnya lebih lambat untuk resource karena butuh training segala macam dan butuh masa transisi sementara masa transisi itu paling susah. Dari satu sistem ke sistem lain paling susah misal sistem ready tapi orang gak ready. Mereka pasti bilang yang dulu lebih enak dll lah. Nah sebagai organisasi ya kita tuh gaboleh maksa, kalo gasanggup resourcenya ya jangan digunakan Bank sendiri skrg juga keteteran dengan maraknya payment kaya gopay dll. Perusahaan makanya rekrut 1000 programmer untuk itu untuk ngejar, mereka cepet banget. Nah makanya dari pemerintah sendiri juga melindungi bank supaya startup2 ini tidak mendominasi dan monopoli. Organisasi untuk siap pake technologynya itu pasti lebih lama karena butuh transisi dan penyesuaian, system sudah ready tapi orang tidak ready. Butuh sosialisasi dan sedikit di push supaya sanggup untuk perubahan ini.
I	Kalau peran dari top management itu apakah berpengaruh pak?
P	Semua perubahan itu berasal dari leadernya, kalau leadernya jalan pasti yang lain akan ikutan dan kalau tidak maka tidak akan jalan dan percuma.
I	Lalu kalau organizational size apakah berpengaruh dalam adopsi technologynya Pak?
P	Pasti berpengaruh, makin besar makin sulit. Coba dibayangkan kalau perusahaan memimpikan 40.000 orang pasti lebih sulit daripada yang hanya 300 orang.
I	Berapa lama biasanya proses untuk mengadopsi technologynya sih Pak?
P	Tergantung seberapa besar technologynya.
I	Menurut Bapak konteks lingkungan bisnis itu mempengaruhi keputusan perusahaan tidak Pak dalam mengadopsi blockchain?
P	Jelas, terutama dalam persaingan ya. Pada perbankan kalau competitor dari bank sebelah sudah bisa buka rekening online atau speed edc nya bahkan lebih cepat maka kita harus bersaing. Dulu kalo mau buka cabang, harus feasibility study misal penduduk berapa ribu, pegawai berapa ribu nah kalo sekarang ya liat aja bank sebelah ada ga disitu, kalo ada ya kita juga bikin. Kadang dari persaingan itulah yang membuat blockchain itu diperlukan karena jadi lebih efisien dan control enak, reduce cost. Karena biasa nya kompetitor sudah melakukan feasibility.
I	Kalau dari regulasi yang ada, apakah berpengaruh dalam implementasi dan adopsi technology blockchain Pak?

P	Pasti ada ya, karena Bank ini adalah sector finansial yang sangat dijaga makanya sampai sekarang masih ada. Kalau di bank-bank itu untuk merubah suatu system itu harus ijin, jadi kadang itu membuat lambat. Kenapa Gojek itu cepat? Karena dia bukan termasuk lembaga finansial sehingga dia bisa create macem2. Contohnya kalau dikita itu e-money, kalau ingin mengikuti regulasi untuk merubah design saja harus ijin OJK. OJK nya sendiri kemampuan untuk beradaptasi dalam perubahan itu agak lambat karena mereka regulator bukan pelaku kaya kita. Misal ovo bisa pake tip ya kita ga secepat itu. Contoh kalo bank mau buat e-money aja prosesnya panjang banget
I	Berarti dari 3 faktor tadi, teknologi, organisasi dan business environment itu apa yang paling penting itu apa pak dalam mengimplementasi blockchain?
P	Yang paling penting dan menantang adalah business environment. Kalau business environmentnya ga menantang kita tidak akan berubah. Entah antara business environmentnya atau teknologinya yang lebih cepet saya gatau. Bahkan ada marketplace luar yang jual reksadana kita, nah kita sendiri kalo mau implement lama. Kaya digital signature jg lama banget prosesnya. Selain itu karena persaingan dengan kompetitor itu juga jadi concern kita.

Participant 5

Position: Founder and CEO

Financial service type: Cryptocurrency trading and Non bank payment

Adoption type: Non-adopter

I	Halo kak , boleh minta tolong jelaskan product dan service dari bisnis kakak tidak
P	Kalo Perusahaan 1 Sendiri itu solving problem of p2p transfer. Jadi kaya kirim uang antar teman, kirim duit dari luar negeri ke indo atau dari indo keluar terus kirim duit dari multiple balances. Jadi kita creating highway through all the wallets. Kita sendiri gaada walletnya. Jadi kita connect ke semua bank dan juga ke semua e-money dan credit card. Kita enabling money movement kaya misalnya kamu dan semua orang lah.
I	Itu kan ada chatnya juga ya kak?
P	Chatnya itu hanya supporting product of the money. Jadi misalnya setelah kirim kamu bisa langsung chat ke merchant misalnya untuk ngabarin “eh ini udah dikirim ya” gitu. Jadi kayak dari situ kita get the idea kenapa kita mau get here karena kita liat di market sekarang kan kamu minimum ada bank account minimal ada dua dan minimum e-money yang saya maksud itu adalah digital wallet ya. Jadi kaya government bank 1, private bank 1 and then gopay and then ovo. Jadi juga kaya on the end of the day kamu ada 5 balances di 5 different environments. Environmentnya semua beda-beda dan purposenya juga beda-beda. Nah Perusahaan 1 Itu becoming the middle men yang mengconsolidate lima-lima nya di dalam satu tempat. Jadi kamu bisa manage balance di dalam satu app gitu. Jadi bisa langsung liat balance BCA kamu, mandiri kamu, OVO kamu, Gopay kamu berapa sekarang juga. Jadi semuanya integrated. Kita bisa tracking spending dan sebagainya begitu.
I	Itu pake blockchain juga kak?
P	Bukan itu Perusahaan 1 nya. Kalo blockchainnya itu satunya lagi yaitu Perusahaan 2. Perusahaan 2 itu adalah trading company. Jadi kita adalah exchange company yang dimana orang bisa beli cryptocurrency sendiri jadi misalnya contohnya kamu punya rupiah dan kamu mau beli bitcoin. Nah kamu pergi ke websitenya perusahaan 2 beli bitcoin di perusahaan 2, nah entar kamu bisa trade. Jadi kaya trading kaya commodity. Di Indonesia, blockchain itu dianggap cryptocurrency dan itu dianggap sebagai commodity. Karena itu commodity maka itu gak diurus under BI sama OJK. That's why it's not legal for someone to buy cryptocurrency under blockchain. Peraturannya udah ada tapi penggunannya belum ada. Blockchain dan crypto ini belum dianggap sebagai currency pembayaran. Cuma dianggapnya sebagai bahan commodity untuk trading kaya ibaratnya kamu beli saham Crude palm oil, bisa beli batubara, nah pokonya dianggapnya blockchain sebagai itu.
I	Apakah benar satu orang hanya boleh beli satu crypto?
P	Nggak2 kalo di Indonesia itu blockchain itu under menteri perdagangan. Jadi blockchain itu diluar BI dan OJK karena dianggapnya sebagai commodity. Jadi itu merupakan 2 hal yang berbeda, yang satu dari crypto ke rupiah dan rupiah ke crypto, ibaratnya kaya money changer. Yang satunya lagi (Perusahaan 1) kaya paypal yang kamu bisa kirim-kirim duit. Nah gimana ngemerge ini dua. Jadi caranya ngemerge ini dua yaitu gini. Kalo misalkan saya ngirim duit ke kamu dari bank mana kirim ke mana, kalo di dalam negeri kan challengenya itu hassle misalnya kaya saya harus tau nomer rekening kamu dan lain sebagainya. Terus kalo misalnya kirim pun saya cuma bisa ngirim dari atm atau m-banking dsb. And then challenge berikutnya adalah limitation of RTGS. Jadi kaya diatas jam 3 dalam satu hari kamu cuma bisa ngirim certain amount. Kalo diatas jam 3 saya kirim skrg tapi dapetnya besok. RTGS on the weekend juga mati, jadi kaya limitationnya banyak. Kedua, kalo misalkan saya mo kirim uang ke luar negeri dari luar negeri ke indo itu hasslenya lebih ribet lagi pertama dan kedua mahal dan itu gak real time juga. Jadi kaya saya harus tau kode banknya kode negaranya dsb. Sedangkan blockchain merupakan teknologi yang connect directly usernya based on their email. Jadi misalkan saya beli bitcoin, saya punya bitcoin di email saya. Misalkan saya mo kirim bitcoin saya ke orang lain, saya tinggal email aja, sesimple itu. Kalo dia mo kirim pake currency apa tinggal di rupiahkan atau ke mata uang lainnya. Dengan kaya gitu kita ngedisrupt businesses dimana yang tadinya kirim duit antar orang itu ribet banget nah dengan blockchain itu jadi simple banget. Jadi kita gak ngereplace as a purchasing , basenya tetep rupiah, dollar atau apapun itu. Tapi bridgingnya aja kesannya itu lebih gampang kalo pake blockchain. Bitcoin

	harganya fluktuatif ga stabil jadi ganti2. Itu challengenya blockchain kedepannya harga yg ga stabil. Makanya ada beberapa koin yang diciptakan untuk stabil untuk mengatasi hal-hal yang kaya gini. Sebenarnya dari sisi teknologi, emang masih early banget ya, crypto itu kan boomingnya baru 4-5 tahun terakhir. Kalo kamu baca news juga sering ada problem kaya dihack lah dll. That's why kita sambil pelan-pelan benerin itu. Saya sih believe banyak hal yang kita lakukan yang bisa bantu banyak orang.
I	Teknologi apa saja yang digunakan?
P	Kalo di Perusahaan 1 itu kaya gini, kamu mesti ingetnya gini misal kamu ada 4 balances nah setiap behavior 4 balances ini beda-beda, gopay misalkan kamu top up 100 ribu (4 kali kamu pake riding, 2 kali kamu pake belanja dll). And then BCA, OVO, dll dengan belanja dan karakteristik yang mungkin beda. BCA lebih dalam lagi dgn amount lebih besar. Dan misal mandiri buat bayar pajak, bayar kartu kredit dll. Skrg imagine kaya kamu dengan 4 balance itu ada misalkan 20 ribu orang dgn diversity berbeda dan mereka juga punya behavior yang beda-beda. Karena behaviornya beda-beda, kita terapkan teknologi AI dimana kita bisa track expensanya kamu. Nah dengan Perusahaan 1 kamu bisa liat behavior kamu. On a bigger picture, kita bisa kasih nation sebuah report dimana behavior org Indonesia itu kayak gimana. Big datanya itu adalah apakah pertumbuhan ekonomi itu bener2 bagus beneran atau gara2 subsidi dari electronic transactions. Itu teknologi AI yang berdasarkan data yang real. Kalo misalkan AI yang cuma guessing itu belum. Jadi saya bikinnya justru saya connectin dulu bikin semua data yang terkumpul, baru AI nya kaya kick in dan milah-milahin tentang ini tuh apasih dll.
I	Kalo yang di perusahaan 2 sendiri gimana kak?
P	Kalo yang di perusahaan 2 itu teknologinya udah terlalu advance sih, mereka kaya currency exchange. Kalo straightforward yang penting itu securitynya aja sih
I	Apa sih yang membuat Blockchain itu menarik untuk diterapkan?
P	Cost efficiencynya sih, jadi gini. Kalo di semua negara, saya mau kirim duit dari bank saya ke bank kamu itu very inefficient. Makanya kamu bayar Rp 6500 tuh 6500 saya bayar ke bank saya itu ada acquiring bank, ada government dan ada kamu. Atau ngga ada switching company abis itu baru kamu. Jadi kaya the way money moves dari saya ke kamu itu ngelibatin 5 pihak. That's why it's inefficient, that's why kamu selalu bayar terus ada limitation of amount dan limitation of time. Jadi karena ini udah jalan selama 40 tahun di Indonesia ya kita biasa-biasa aja gitu. Padahal ada teknologi baru yang bisa ngasih service lebih bagus gitu. Ngasih service yang kaya saya kasih ke kamu saya mau ngambil dari mana aja dan kamu mau nerima dari mana aja dan real time. Perusahaan 1 dan Perusahaan 2 itu ngecut all of this lah, the efficient process of money movement.
I	Apakah kakak punya ekspektasi lain dari pemanfaatan blockchain di Perusahaan 1 dan Perusahaan 2?
P	Kalo saya very focused in money movement untuk sekarang. Sebenarnya penerapan blockchain kalo di tempat-tempat lain itu udah banyak banget. I think untuk storing data ya yang saya tau di health industry. Jadi kaya kalo kamu sekarang sakit terus pergi ke rumah sakit A terus kamu sakit lagi next time dan pergi ke rumah sakit B, data history medical kamu itu gak linked. Nah, dulu sempet ada idea gimana kalo satu orang punya health history itu ditaro di cloud ditengah-tengah dan bisa diakses sama semua rumah sakit. The centralize system itu dimana gak ada yg punya, gak ada regulatornya. it can be operated by everyone yg menggunakan system itu.
I	Menurut kakak, problem apa yang paling bagus untuk diselesaikan oleh blockchain pada financial industry?
P	Jadi kalo Perusahaan 1 sama Perusahaan 2 itu focus on money movement. Jadi penerapan yang bakal saya terapkan pertama kali itu adalah how to make it efficient untuk orang mentransfer uang. Jadi efficiency yang pertama, ini bukan blockchain ini lebih kaya saya mau kirim ke kamu, saya cuma perlu tau nomer telpon kamu, ini kan experience ya. Yang kedua saya mau ngirim ke kamu, gaperlu dependency untuk acquiring banks, switching company, regulator, dll. Jadi saya mau kirim ya kirim aja supaya efficient and then move very fast. Dan itu penerapan teknologi blockchain pertama yang udah ada di Indonesia.
I	Menurut kakak apakah blockchain dapat digunakan di semua ranah di financial industry?
P	Bisa tapi bakal butuh waktu yang lama banget. Jadi gini, sekarang kita udah 40 tahunan menggunakan system yang udah ada sekarang. To have a new system yang bakal ngedisrupt system yg lama2 ini bakal banyak resistance dari player-player yang menggunakan sistem2 yang lama ini. It will take time lah pelan-pelan satu-satu dan lama2
I	Kalo di payment katanya ga terlalu berguna ya blockchain?

P	Makanya saya bilang, di payment kenapa gak terlalu berguna karena sampe sekarang system yang udah berjalan selama 40 tahun ini udah jalan. Ketika ada sesuatu yang baru, semua investor yang udah invest jutaan dollar di system yg lama gaakan mau untuk terima hal yang baru ini. Ini kan ngedisrupt sistemnya GoPay, sistemnya BCA
I	Dengan cara apa blockchain bisa menguntungkan perusahaan dan customers?
P	Menguntungkan dengan cara experience yang tadi sudah saya bilang, untuk kirim uang dll. Kalo customers, saya bisa ngasihnya adalah transfer uang lebih murah dari harga yang sekarang. Itu yg paling gampang. Terus gaada limitation kaya harus maksimal jam 3 atau weekend gabisa. Kalo untuk bisnis itu lebih bagus lagi gini. Bisnis biasanya pembayaran vendor, pembayaran siapa-siapanya itu biasanya transactionnya gede. Dan RTGS itu ada limitation of 25 million keatas. Untuk bisnis ini udah paling gampang, jadi kaya on the weekend mereka mau bayar orang itu bisa jalan. Jadi gak ada lagi, things yang kita disrupt ya, gak ada lagi yang kaya “yah saya gak bisa bayar karena bank tutup”. Cuman kan bisnis sabtu minggu tetep jalan. Kaya toko, pembayaran vendor sabtu minggu tutup. Nah bisnis mesti tetep jalan tapi. Nah Perusahaan 1 bisa solve that problem
I	Apa factor signifikan yang mempengaruhi dalam meningkatkan intention untuk menggunakan blockchain?
P	Faktor significant adalah security. Jadi gini, centralized system adalah system yang udah ada selama 40 tahun ini. Centralized system adalah bank Indonesia, acquiring banks, switching companies, kayak prima, alto, yang biasanya ada di belakang kartu. Mereka udah selama berpuluh-puluh tahun invest on security that makes sure ini aman. That's why you pay fee. Kamu bayar security untuk misalkan saya transfer kamu satu juta dan misalkan satu jutanya ilang di tengah jalan. Bank make sure untuk talangin si satu juta tadi. Itu centralized system. Kamu berarti bayar orang untuk make sure ini jalan. Meanwhile, Decentralized system itu gak ada regulator atau playernya . Jadi system blockchain tuh kaya gini. Saya ada computer, kamu ada computer, computer kita dipake untuk ngepower transactions yang happening di dunia blockchain. Jadi saya kirim uang ke kamu itu terjadi antara saya dan kamu dan ribuan jutaan orang yang ada di system ini. Jadi yang ngepower datanya dll itu kita-kita juga. Jadi kaya asas kebersamaan gitu. Nah dari jutaan orang yang ngepower transaction kita, ada juga orang yang intentionnya gabagus. Dia bisa ngehack, cut middle man kita dan ngambil duit saya dan kamu gak di kasih. Jadi untuk security di decentralized system itu lebih vulnerable dan soft disbanding institution atau organization. Itu challenge yang paling gede yang ada sampe sekarang. Itu adalah challenge dimana orang masih gak believe sampe sekarang. Kamu juga mesti baca data, the more we get hit then the more we learn to develop. The more we hit, kita benerin lagi pelan-pelan dan lama2 makin strong. Semakin strong dan kita balik lagi ke core problemnya. Core problemnya adalah inefficiency of moving money. Dengan kita yang semakin lama semakin strong itu berarti makin bagus kan dan lama2 orang masuk juga. Jadi adaptationnya itu emang takes time.
I	Kalo makin banyak yg running the blockchain itu makin bagus?
P	Semakin banyak, semakin org believe itu semakin bagus. Cuman itu bakal create resistance dr player2 yang udah main selama ini kaya bank dan acquiring banks.
I	Orang yang running the blockchain itu dapet insentive?
P	Iya, kamu inget ga dulu orang yang namanya harvesting blockchain? Jadi kaya mereka farmer/miningnya. Mining itu siapin server yang banyak banget, supaya ngepower transactions between orang. Nah itu entar ada rewardnya. Makanya mining itu dapet duit. Nah tapi rewardnya itu jauh lebih kecil daripada RTGS 6500 (menit 20-21 ulang lagi)
I	Karakteristik teknologi?
P	Complexity lebih susah karena unregulated, karena bisa aja hari ini gini besok beda, jadi instability, sedangkan system yang centralized itu lebih stabil , bank jam 9 nyala jam 3 tutup, kalo kita power by human2, kalo lg mati yg mati jadi uncertaintynya lebih banyak. Walaupun saving money, tp dependabilitynya ga terlalu. Kadang kalo sistemnya lg mati
I	Organization? Butuh waktu lama?
P	Tergantung kompleksitasnya, tergantung problem yg mau dissolve
I	Kalo compatibility?
P	Jadi gini, kalo misalnya problem yang mau dissolve adalah uang untuk transfer. Jadi, selama kamu tau kamu dapet duitnya dan saya tau saya kirim duit sejuta dengan uang costnya cuma 1000. Kamu dapet 1juta itu solve problem kan? Kalo di belakang ranahnya blockchain terus kamu pasti ga peduli karena kaya kamu udh dpt sjeuta dan yaudah. Kalo misalnya kita langsung hajar di depan, missal

	saya langsung bayar pake bitcoin, kita langsung break the rulesnya BI dan OJK. Tapi kalo kita run in the back end as a jadimisal rupiah -> bitcoin, bitcoin -> rupiah, selama itu sejuta dan feenya cuma 1000 itu kamu akan pake2 aja kan
I	Peran organisasi dalam adopt blockchain
P	I think organisasi bagus untuk sharing ya. Jadi kaya, what work and what does not work. We believe in sharing kita udh sampe mana kita kasih tau. Cuman kadang untuk competitor yang liat something yg kita bikin, yg itu profitable, mereka bisa copy. Jadi kaya pro and contra. organisasi yg sesama player kadangbisa saling bantu atau saling copy2 atau iri2an gitu. Jadi kadang kita mesti hati-hati juga. Which one we talk more and give information
I	How about top management support? (CROSS FACTOR)
P	Support dari pemerintah itu yang paling pengaruh, dari regulatory. Sebenarnya kalo top management itu bukan dari business, regulator tu juga sama importantnya sama business.
I	How about organization size?
P	Kamu punya 100 programmer dibanding 1 really advanced programmer itu sama aja. Jadi size doesn't really matter. It's all about the quality. Kalo kita enhance the technology kita kuat di quality not the quantity.
I	Kalau dari business environmental itu apa aja sih kak yang pengaruh?
P	Menurut saya adoption blockchain itu mesti pelan-pelan, stage by stage. Kalo misalkan kita solve untuk uang transfer, selama uang transfernnya nyala dulu terus belakang yg run blockchain masih aman, yaudah kita hajarnya on the back end dahulu aja, gak di depan. Selama itu masih jalan dan solve the current problem. Tapi kalo kita masih di depan kan banyak resistance, dll. Jadi kaya pelan2 biar adopsinya lancar. Setelah bisnis percaya, bisnis suka produknya, bisnis pasti ngasih reference ke bisnis lainnya. Jadi kita kaya gerilya gitu.
I	How about regulatory? Seberapa pengaruh sih?
P	Pengaruh dalam ngeluarin peraturan2, kadang kalo bisnis baru mau jalan tapi regulator set the limit yang terlalu tinggi dan bisnis ga berkembang juga.
I	Kalau di Indonesia sendiri bagaimana?
P	Kalau di Indonesia mendukung. Saya litany team dari bappeti dan mendag itu kan ngurusin blockchain dan cryptocurrency kan karena dianggap sebagai commodity. Mereka sih support kita sih so far. Mereka kasih tau yang gimana things yang gak bisa kamu lakukan dan yang kamu Ok
I	Bagaimana masa depan blockchain di Indonesia?
P	It will takes some time yang pasti gak akan bisa kaya ini karena kamu mesti ingetnya gini. Dulu kita ada regulatory of businesses kaya bank sama bank kartu kredit. And then 1/3 rakyat Indonesia pake itu and then come the new player which is e-money, kaya gopay ovo yang which hampir semua orang Indonesia pake itu dan ngalahin semua bank. And then the third player datang lagi which is cryptocurrency. Jadi kaya waktu e-money baru keluar aja resistance dari bank udah banyak banget apalagi sekarang ada cryptocurrency. Resistancenya tambah banyak lagi yaitu dari bank dan e-money.
I	Kalo dr bank sendiri, apakah mereka mau bekerjasma?
P	Nggak, sebagai alat pembayaran gamau. Tp kalo partnering itu.. nah kalo bank itu system bisnisnya selama ada uang ngalir ke dia ya does not matter. Jd makanya kenapa crypto digunakan sebagai alat commodity sebagai asset.
I	Dari factor T-O-E yang paling penting apa?
P	Tergantung sih, kalo kamu lagi butuh something kaya regulatory, maka regulatory paling penting. Tapi, smua lancar, bisnisnya ga jalan, maka bisnisnya yg paling penting. Jadi ini tuh tergantung stage yang dijalankan. Semuanya sama pentingnya. Penggunaan blockchain dan crypto itu banyak banget cuma kamu mesti kasih satu example yang pasti dan tajam, jangan broad. Karena kalo broad jatuhnya ngambang, nah saya bisa kasih satu contoh yang paling pasti yaitu perpindahan uang. Jadi ambil dari ada problem apa dan solusi apa yang ditawarkan gitu, adoptionnya kaya gimana, regulatory gmn, gitu Saran saya ke kamu, kamu conduct interview sama 4 player yang relevan yaitu blockchain adopter kaya saya, e-money, bank sm regulator biar datanya rich.

Participant 6

Position: Head of business strategies
 Financial service type: Robo Trading Platform
 Adoption type: Non Adopter

I	Kaka sekarang di Lubna.io bekerja sebagai apa?
P	Sebagai Investment Manager
I	Apa saja sih produk dan vertical dari Lubna.io
P	Kita fokus ke bikin platform untuk algorithmic cryptocurrency trading. Jadi buat traders dan investors yang punya strategi tertentu kita bisa automate, nanti kita list di platform kita, nanti user yang awam bisa ngikutin strategynya. Nanti bagi hasil antara si penyedia algoritem dengan lubna nya.
I	Apakah ini sudah menggunakan blockchain kak?
P	Lubna.io nya sendiri tidak menggunakan blockchain, akan tetapi aset2 yang kita invest kan adalah asset-aset berbasis blockchain
I	Kalau begitu teknologi apa saja sih kak yang sudah di terapkan di Lubna.io
P	Sebnernya kita kayak fintech biasa sih, akan tetapi hubungannya dengan blockchain adalah produk-produk investasi yang ada di kita itu berbasis blockchain.
I	Menurut kaka apa yang membuat blockchain menarik untuk di terapkan?
P	Blockchain itu ide awalnya karena ada masalah dari trust, pertama kali dibikin white paper oleh satoshi nakamoto belum ada yang namanya blockchain. Beliau masih bikin white paper tentang peer-to-peer electronic assistant. Dia ingin menghilangkan adanya trust, yang tadinya ketika kita ingin mengadakan transaksi perlu ada intermediary parties, dengan adanya blockchain hal itu tidak diperlukan lagi untuk transfer value dari satu orang ke orang lain. Jadi usecase utamanya adalah, apabila satu hal yang tadinya diperlukan trust, dan dimasa depan tidak diperlukan trust maka blockchain itu diperlukan. Contohnya penerbitan uang, transaksi, transaksi antar negara yang membutuhkan intermediary parties contohnya visa, paypal etc, itu downside dan upsidenya ada kalua visa cepat, namun mahal dan lain sebagainya. Banyak sekarang fintech yang backbonenya pake fintech technology yang bisa menyelesaikan transaksi, cross-border, dengan waktu yang cepet banget dan hamper 0 nilainya karena intermediary party nya di tiadakan
I	Kalau di lubna nya itu produk tradingnya crypto ya kak? Itu prosesnya bagaimana sih kak? Apakah cryptonya di rupiahkan juga?
P	Kita hamper crypto-to-crypto sih, soalnya yang nilai exchange nya besar itu crypto. Jadi ada suatu cryptocurrency namanya USDT (USD Tather) itu nilainya itu nilainya kita sebutnya stable poin, soalnya nilainya di backup sama real usd, selalu satu banding satu sama usd, nah itu yang kita tradingin ke asset-aset crypto lainnya yang sifatnya volatile. Jadi misalnya pertama initial investment 100 USDT terus kita trade-parse ke cryptocurrency lainnya yang sifatnya volatile kan nilainya berubah berubah kan
I	Itu berarti apakah contoh cypto yang menstabilkan kah kak?
P	Jadi awalnya tujuan awalnya cryptocurrency adalah dijadikan alat pembayarankan, tapi karena nilainya fluktuatif, orang jadinya mulai tertarik untuk berspekulasi ke harga cryptocurrency. Jadi pas harganya naik dijual, kalo turun di beli lagi. Jadi kalo dibandingin ke fiat, nanti usd nya naik dan begitu gitu aja. Karena masalah kalau dijadiin uang kan syaratnya 3, harus bisa jadi buat exchange, secara value dan satuan hitung. Crypto currency bisa jadi medium exchange murah dan cepet, secara value juga bisa karena cenderung naik dang a jeblog, tapi dia bermasalah ketika dia jadi satuan hitung. Misalnya uangnya (cryptocurrency) hari ini dibandingin sama harga besok sangat berbeda-beda karena fluktuatif bgt sehingga kan kalo jadi satuan hitung ga jadi ga efektif. Karena masalah itu jadi banyak yang mulai captain yang namanya stable poin, jadi cryptocurrency juga tapi di backup sama algorithm tertentu sehingga nilainya bisa cenderung lebih stabil dan ga terlalu fluktuatif.
I	Apakah cryptocurrency penggunaanya semakin meningkat atau bagaimana?
P	Penggunaanya semakin meningkat, kalua diliat statistiknya. Sebnernya datanya susah di dapatkan, tetapi yang bisa diliat adalah rate of route dari user-user yang local, bagaimana orang indo bisa

	tuker in rupiah ke crypto naik dari situ, yang besar sekarang kan sekarang indodax sama luno, nah dari situ keliatan penggunaanya naik terus. Tapi gatau real usersnya berapa, karena kan bisa jadi satu orang itu bisa satu orang bisa punya 2 account.
I	Apakah kaka punya ekspektasi lain untuk pemanfaatan blockchain?
P	Saya aktif di komunitas blockchain juga yang tidak hanya ngomongin trading saja, tapi juga ngomongin technology dan adoptionnya. Harapannya adoptionnya terus meningkat karena inevitabe.
I	Kalau menurut Kaka apakah di Indonesia akan menghasilkan banyak manfaat dengan blockchain di industri finansial?
P	Kalau industry finansial iya. Sekarang mulai banyak orang-orang yang unbanked. Selama internet masuk, blockchain bisa dijadikan jembatan buat orang-orang yang unbanked itu biar bisa banked juga. Misalnya, sekarang paling banyak casenya orang cross-border payment yang masih susah itu misalnya TKI mau kirim uang ke kampungnya, sekarang rata-rata keluarganya di kampung keluarganya gapunya visa, untuk pake swift itu kelamaan jadi kebanyakan mereka pake western union dan itu mahal. Western union itu on paper itu hamper free, tapi missal yang dikirim dolar dari luar itu besar, tapi sampe disini itu jadi kecil nilai kerupiah nya. Nah kalau pake crypto, nah asal ada internet di tempat asalnya itu bisa di cairin dengan biaya yang super murah ke banknya sendiri
I	Kalo menurut kaka kapan sih blockchain itu bisa menjadi hal yang common di Indonesia
P	Masih lama ya. Optimis sih, tapi pasti masih lama dan usecasenya sebenarnya harus diakuin ga sebesar itu di sector tertentu yang emang trust di perlukan, usecasenya ada Tapi kadang-kadang ada beberapa orang yang maksain penerapan teknologi ini yang trust itu gadiperluin, jadi ga applicable dan malah jadi ga efficient business modelnya.
I	Apakah blockchain itu tidak cukup secure dan bisa di hack kak?
P	Jadi tiap ada transaksi atau ada perubahan di algoritma itu memang bisa dilakukan, kalau ada konsensus dari miner. Jadi blockchain itu kaya demokrasi misalnya ada transaksi dari a ke b lalu di confirm secara peer-to-peer oleh para miners kalau pake system pull over. Ada istilah 51% attack jadi 1 miners punya computing power lebih besar dari 50 percent. Jadi dia bisa confirm transaction yang sebenarnya tidak terjadi karena consensus nya lebih besar dari 50%. Itu on paper memang bisa terjadi tapi sampai sekarang tidak pernah terjadi. Kalau yang sering di hack itu bukan blockchain nya tapi exchangenya karena gapake blockchain, dia pake centralized server.
I	Masalah apa sih yang paling baik untuk diselesaikan di industry finansial? Lalu apakah blockchain itu baik untuk di implementasikan di semua ranah industry?
P	Yang paling baik dan perlu trust banget itu di central bank for monetary purposes, penerbitan uang, distribusi yang termasuk monetary policy itu lebih baik di implementasikan blockchain biar transparan dan tidak ada penyalahgunaan wewenang. Kalau fintech, kalau emang trust diperlukan dan dengan adanya trust itu menambah biaya dan bikin efisien maka perlu blockchain. Tapi kalaupun diperlukan dang a membuat biaya mahal, maka tidak diperlukan banget.
I	Dengan cara apasih kak blockchain bisa menguntungkan perusahaan dan customer
P	Customer sebetulnya akan trust ya dan gamungkin perusahaan bisa curang kalau bisnisnya blockchain based, kecuali blockchainnya private. Kecuali kalo diterapkan diatas public blockchain perusahaan gabisa curang, karena kalau ada perusahaan customer kan bisa check. Nah customer diuntungkan darisana. Kalau untuk perusahaan kalau public blockchain itu kurang menguntungkan, tapi untuk users sangat menguntungkan karena transparent. Paling private blockchain itu bisa menguntungkan ketika perusahaan secara b2b bekerjasama dengan perusahaan lain, kan itu perlu trust. Nah dia bisa bikin sonsersium, jadi ketika ada sesuatu perubahan dan ada sesuatu hal baru yang di confirm karena servernya terbagi atas beberapa server maka perusahaan tidak akan curang satu sama lain. Tapi jika hubungannya hanya b2c, customer yang akan lebih banyak diuntungkan seharusnya
I	Apakah betul orang yang menjalankan atau running blockchain akan mendapatkan incentive juga?
P	Iya kalau sistemnya itu dia pake sesuatu yang dia dapet incentive. Kayak misalnya bitcoin kan itu gaada intermediary party ya tapi ada yg namanya Miner. Jadi misalnya a transfer ke b, traksaksinya itu akan di confirm oleh para miners, nanti algorithm nya akan memberikan reward ke minersnya.
I	Kalau private blockchain ada minersnya ga?
P	Sebenarnya bukan miners, tapi yang maintain si servernya aja/ yang provide computing powers. Kalau public blockchain semua orang bisa jadi miners, caranya provide computing power aja sih.

I	Apa factor yang paling significant yang dapat mempengaruhi perusahaan dalam penggunaan blockchain?
P	Balik ke trust lagi, ketika trust itu diperlukan artinya ada moral hazardkan. Ketika dua orang perlu trust artinya salah satu ada potensi untuk curang. Karena itu semua hal yang dilakukan keduanya harus transparent dan keduanya harus punya control, itu kenapa harus ada trust. Kalau memang trust itu memang diperlukan, blockchain maka bisa di gunakan. Tapi memang kalau dari awal trust nya tidak diperlukan maka gaperlu pakai blockchain.
I	Kalau dari karakteristik teknologi itu kesulitannya apa dengan penyesuaian dengan market?
P	Sebenarnya lebih sulit ya dan bisa dibilang lebih inefficient blockchain dibandingkan centralized server. Centralized server itu misalnya mau ubah data ya tinggal diubah aja, kalau pakai blockchain kalau mau ubah data tidak bisa langsung diubah karena harus di confirm dari semua bagian dari network. Udah gitu sekarang cost developingnya lebih mahal karena sedikit developers yang menguasai. Lalu blockchain itu immutable, dalam artian ketika kita sudah memasukan data ke block, data itu gabisa di apus. Misalnya bikin aplikasi diatas decentralized apps (blockchain) ketika ada bug diselesain itu langsung di solved maka harus bikin baru lagi, kecuali itu centralized. Tapi balik lagi perlu trust atau ngga, kalau perlu trust ya gapapa inefficient tapi kan gaperlu takut di curangin orang.
I	Biasanya yang perlu trust itu apa sih kak?
P	Financial
I	Lalu pendapat kaka terhadap peran organisasi dalam mengadopsi blockchain itu apa?
P	Room to innovate itu yang pasti. Selain itu dukungan dari top management itu perlu terutama itu dari CFO nya. Karena untuk develop a whole new blockchain infrastructure kan tidak murah karena mahal untuk bayar developers dan consultant. Selama ada budget dan company nya mau innvovate, diluar dia mau adanya blockchain atau ngga itu bisa kejadian asal ada budget dan perusahaan mau innovate. Karena kadang-kadang perusahaan itu gaperlu blockchain, tapi karena tujuan fundraising dipaksa-paksain ada blockchain nya. Karena sekarang VC lagi suka buang-buang duit kalau ada yang berbau new technology. Padahal bisnisnya ga sustainable, usecasenya gaada, gadiperluin adanya blockchain atau AI di bisnis itu, tapi dipaksa-paksain aja buat jualan dan jadi jargon padahal belum perlu
I	Kalau di lubna itu kenapa ga pakai kak?
P	Karena lebih efektif tidak pakai blockchain. Karena dalam pengambilan keputusan lebih efektif dan kita berjalan belum lama, karena aplikasi kita bikin di mobile maka ketika ada bug baru maka kita harus bikin app baru dan gabisa di fix dari aplikasi yang sudah ada.
I	Apakah lubna.io itu seperti INDODAX?
P	Bukan, kalau indodax itu kan bursa. Kalau lubna.io itu pengen bantu orang-orang yang mau invest/speculate di cryptocurrency tapi mempunyai pengetahuan trading yang minim. Jadi kita bisa kasih sinyal kita bisa trade on behalf of them tapi tanpa kita menghimpun dana. Ada suatu cryptocurrency exchange yang terbesar di dunia itu namanya Binance, mereka meyediakan API service. Jadi funds nya di Binance, lubna.io partneran sama binance. Nanti funds yang didalam sana lubna.io yang trading-in.
I	Menurut kaka, konteks lingkungan bisnis itu berpengaruh ga sih dalam pengadopsian blockchain?
P	Berpengaruh banget sih, karena mungkin banyak bisnis yang memang lingkungannya ga terlalu welcome ke opportunity to innovate misalnya bisnis keluarga yang pingin settle aja. Tapi kalau bisnisnya berisi orang-orang yang memang selalu willing to try new innovation, itu bakal lebih mudah untuk drive ke blockchain walaupun belum tentu perlu.
I	Kalau pengaruh environment yang secara external bagaimana kak?
P	Pasti pengaruh tapi ga selalu. Kayak misalnya kompetitor yang saling melihat salah satu sudah mengadopsi blockchain tapi kan bisa jadi belum tentu perlu juga.
I	Kalau di Indonesia sendiri sudah banyak blom sih kak yang sudah implement blockchain?
P	Sudah lumayan ada beberapa, tapi masih bisa dihitung dan masih baru. Tapi memang kebanyakan orang Indonesia bikin perusahaan blockchain tetapi takut sama regulator, biasanya mereka pake badan hukum Singapura.
I	Kalau blockchain itu diatur dibawah menteri perdagangan ya Kak?
P	Blockchainnya sebenarnya tidak diatur karena tidak bisa diatur. Yang diatur dibawah menteri perdagangan adalah blockchain related assets, jadi asset-asetnya (cryptocurrencys). Nah itu

	sekarang diatur oleh bappebti yang dibawah kementerian perdagangan. Tapi bukan blockchainnya yang diatur, tapi asset-asset yang terkait dengan teknologi blockchain
I	Apakah ada kendala atau tantangan ga sih kak ketika mengadopsi teknologi blockchain?
P	Sebenarnya sekarang orang masih meraba-raba selain currency, karena killer app-nya itu untuk jadi backbone itu bikin currency baru. Tapi sekarang orang masih mencari dan meraba-raba usecase baru. Namun karena menurut saya killer app nya itu buat jadi backbone new currency, tentu hambatannya adalah regulatory compliance. Karena tidak di semua negara menerima kalau ada mata uang lain yang boleh dipake selain dengan mata uang nasionalnya seperti di Indonesia.
I	Kalau dari semua factor sebelumnya secara technology, organization dan environment yang paling penting untuk adoption itu apa kak?
P	Kalau untuk mass adoption, itu parameternya itu network effect kayak misalnya kita ngomongin blockchain jadi backbone untuk cryptocurrency. Patokannya contohnya begini, telepon itu gada nilai atau harganya. Telepon itu bisa jadi bernilai karena bisa menghubungkan kita dan oranglain. Jadi bukan teleponnya yg dinilai tapi network effect dari penghubung untuk orang lain. Kalau tidak bisa menghubungkan satu dengan orang lain, maka network effectnya tidak ada dan valuenya bahkan tidak ada. Telepon bisa di adpot secara massive bukan karena telepon pada waktu itu adalah teknologi baru saja, tetapi juga karena tetangga dan sodara kita pake telepon sehingga dirumah kita merasa perlu pake telepon dan sebaliknya. Cryptocurrency dan blockchain pun seperti itu, ditentukan oleh network effect yang balik lagi ke orang-orangnya. Apakah masyarakat sudah mau bergeser ke cryptocurrency, kalau belum banyak, maka akan masih stuck menjadi alat spekulasi dan bukan menjadi store of value, needs of payment and needs of account seperti real currency. Misal saya punya bitcoin banyak tapi makan dan bayar utang gabisa pake bitcoin, berarti network effectnya kan belum ada kan, sehingga adoptionnya belum bisa naik. Tetapi sekarang pelan-pelan adoptionnya udah mulai naik. Walaupun di Indonesia belum ada yang memakai sebagai day-to-day needs of payment karena dilarang oleh Bank Indonesia. Tapi waktu saya ke Praha, beli topi bisa pakai cryptocurrencies dan di luar Indonesia sudah banyak yang bisa akan tetapi belum massive dan di komunitas dan kelompok tertentu saja. Kalau saya menihatnya adoptionnya tidak akan massive dalam 4 dan 5 tahun. Biasanya orang menabung karena terpaksa seperti di Venezuela yang mata uangnya hancur sehingga ketika orang menabung, valuenya akan hilang terus. Sehingga mereka mulai menabung dengan cryptocurrencies yang nilainya at least tidak sejatuh nilai mata uang local dan gampang bisa dikelola pakai handphone dan lebih mobile bukan physical money.
I	Kalau private blockchain factor yg mempengaruhi itu apakah berbeda kak?
P	Adoptionnya dipengaruhi oleh trust. Biasanya antar divisi atau antar cabang biar data bisa di jaga biar tetap sinkron pakai private blockchain bisa. Tapi sebenarnya solusinya bisa pakai centralized system. Biasanya usecasenya itu di supplychain itu dari hulu ke hilir biar data nya sinkron dan gabakal missed di tengah itu pake private blockchain.
I	Dari lubna.io sendiri apakah ingin membuat system berbasis blockchain?
P	Kalau memang memungkinkan kenapa tidak. Akan tetapi belum ketemu alasannya kenapa kita harus decentralized it. Mungkin bisa decentralized tapi kita yakin bakalan lebih efficient kalau run nya di centralized server kayak sekarang. Jadi kalau ada bug atau error bisa di selesaikan saat itu juga.
I	Berarti untuk intentionnya terhadap penerapan blockchain di lubna.io itu bagaimana?
P	Kita netral
I	apakah dari IT skills nya yang ada di perusahaan itu berpengaruh dalam penerapan blockchain di perusahaan?
P	Pengaruh banget juga, karena itu kan hal baru. Mungkin ga lebih susah untuk develop blockchain infrastructure, akan tetapi perlu kemauan untuk belajar hal baru dan belajar dari awal lagi dan gasemua orang yg udah di senior level itu mau belajar lagi.

Participant 7

Position: Head of Digital Banking
 Financial service type: Conventional Bank
 Adoption type: Non-Adopter

I	What product and service do you sell ?
P	Payment service lending. Life finance tool to put life you really want before the money. You can use to payment, borrow money, finance
I	What kind of technology is incorporated with our company?
P	Our company is pretty cutting edge technology from a core engineering IT. Micro services centric. It uses a little bit of artificial intelligence, advance data analytic,
I	Have you adopt blockchain?
P	It does not use blockchain
I	Do you know about blockchain?
P	Yes I know absolutely
I	Are you aware about its function for financial service?
P	Well im aware of some things that people do with this, but there might be other things that might do.
I	Do you have any expectation of blockchain function for your company and business sector ?
P	Not at this stage and I don't know this is helpful for you or not but in some ways I'm a bit sceptical towards blockchain. I do believe that blockchain is very innovative, very clever, and potentially very useful technology. But I think it's not obvious yet, what useful it has for consumer banking or consumer financial services. So, I definitely well aware and has seen as its use on trade finance as something in corporate banking as syndicating loans. So there is number of uses cases of blockchain in financial services and for retail financial consumer of financial services I would describe it as a solution for problem, It's a great solution but I don't know what it solven yet. The only real application for consumer today I know is probably cryptocurrency like bitcoin and I don't yet see the other real application and so far they do not give other meaningful way. So I think we still searching for the types of customer problem that could actually be solved by blockchain.
I	Do you have real expectation yet?
P	No, so I cannot think of any problem or any customer pain point which we have that we would likely use blockchain. At the moment, I think blockchain is a great technology but I still don't know what its usage yet.
I	Have you consider on adopting it?
P	Yes, I've already look out about blockchain and I also have mathematician background and find that the mathematical structure behind it is interesting. I've look about the solution about finance, indicated loans or other types. But, to my mind that does not apply to business like my company or consumer service. I also look about cryptocurrency, but again I don't yet see that they actually solve a problem that normal day to day customer have. But I think one area that might be helpful is there are some central banks in the world like France and Sweden that are looking to set a electronic currency issued by a central bank, so it look a little bit like physical money issued by central bank, but then it's the electronic form. Yeah that may or may not use blockchain as an underpinning technology. But if, of course, one or more country start to issuing blockchain based currency , it might becoming very relevant for consumer, but I don't think Bank Indonesia is planning anything about this.
I	What do you think is the most interesting part of blockchain that may influence your interest towards adopting it?
P	I mean in the end, the most interesting feature of blockchain technology is the fact that you can have a fully trustable for a record without a central authority. That is why I don't see the immediate advantages for my company or general retail customer financial services because I don't think there is any situation where I desperately need trusted record without any central parties. But again, if I were in SME or commercial area where I look for trade finance then blockchain is a definitely. Because in that area, this is a huge pain point. because its trust boarders so any central banks or government cannot play the role of central authority because its actually

	plays by multiple countries. In most cases, the two parties trading will not share with bank either, so again one bank cannot be the central party. So, in those scenario, blockchain has the very obvious role to play because you do need trusted records of trade and trade finance related flows and you do not have any trustable parties. So, it's highly relevant and it is solution for a real problem but sadly that feature, I do not think as a problem in retail financial services that I can solve it yet.
I	To what extent do you expect blockchain for your current services at your company?
P	No
I	Do you think the technological characteristic and benefit of blockchain might increase or influence you to adopt it?
P	Umm I think if someone points out the problem in retail financial services, I would immediately see blockchain as a wide solution most likely. If I started work outside or in area in trade finance, I would see it too. In some ways, technology could evolve in a way to be more attractive , it can still be slow because of the computational heaviness involved . if that can be improved without cutting the security of the system I imagine that might it more useful in particular. Even if I am more convinced by cryptocurrency today, I would say that would not be suitable for small retail finance because now I can transfer money much quicker without bitcoins or whatelse. But if cryptocurrency transfer can be much quicker it might become more interesting. But for now I still would not use it. (benerin lg part ini)
I	Do you think that blockchain is difficult to undertand, used, and implement?
P	Umm broadly speaking yes. I think there are only a few people actually who understand blockchain and fewer people who understand the mathematics behind blockchain. That's it. That itself should not be a problem because most of people don't understand how smartphone works and they use it everyday. So I don't think the complexity of blockchain matters that much towards the adoption. As long as you clever engineers that can apply it that would be fine. But back again, the problem is cryptocurrency, like bitcoin etc is user unfriendly , it much easier to use ovo or gopay. And that is the problem, if u don't make a user friendly for end customer very straightforward and easy, then people are not going to use it.
I	Do you see blockchain is relevant and compatible for your company?
P	For our company no
I	Do you think that the compatibility of technology for your current service is relevant towards blockchain adoption?
P	Absolutely. For me it always start with customer needs. If consumer in Indonesia who are our company customer, if they have a problem or pain point on financial management that I could solve with blockchain, then I would implement blockchain tomorrow. But, right now I simply the problem customer has that can be solved by blockchain. Most people I asked having problem with their personal financial management, how to manage budgets, how to keep up with it but I don't see that blockchain could solve that problem. For me, relevance comes from customer needs and unfortunately blockchain is not the solver.
I	So, what do you think is the organization role as a part of adopting blockchain as technological innovation?
P	As I said before that our company is not yet going to adopt blockchain. But our company has a company part which include of SME's and microfinance that might going to be helpful with blockchain. But our company is not and not considering it until we find customer painpoints.
I	Organisational readiness?
P	Yes, certainly that's going to matter. For instance, for a thing like blockchain, if you do not have at least some teams, people and capabilities that does not understand how the technology works like engineering team that could connect the technology with your apps or website then it would be easier, although you can outsource the technology but it could be more dangerous , it certainly matters to have internal capabilities to adopt blockchain. You also need people who keep looking for customer pain points who can give an answer what customer painpoints could be solved by blockchain. If no one can identify that, you will end up not using it. So yes that matters, but for me that is not the primary barrier. For me, the primary barrier is simply no customer problem that we could solve with it. But if there were, we would need organizational capability in order to fulfil the adoption of blockchain.
I	To what extent does top management support influence you on adopting blockchain as a technological innovation?

P	Typically I would say that they have a very big influence. Especially because this is likely, I don't think blockchain is likely to be a big thing from a customer value proposition perspective, so it really require a major new feature of product or whatever you offer, realistically that would be offered by senior management. Secondly, going back to the point of view of an organization, it is quiet likely that organization should strengthen some skills and capabilities of people or resource in order to apply it, again that's very likely to meet with senior management attention, so yeah I would that something as major as blockchain would also affiliated with something as serious as senior management.
I	Does the size of an organization plays a role to adopt technological innovation?
P	Yes, but it's very complex in a way how it does. So, on the one hand sometimes it's very difficult for small companies to adopt certain technology, because they may not have the resources, the money required to build it, to hire the people to get the vendor to build it, and so on. That might be easier for larger organization for resource. On the other hand, a lot of larger organization tend to be less innovative, more change resistance, etc. so, for blockchain I think it can be either from a more tech perspective, the advantage of small companies active in some form of blockchain including the startups, they often have struggle bringing the customer because they don't have a large customer base yet. Large companies like large banks in particular have all that, but they have been slower to adopt it because of good reason like wow it's a great technology but how does it help with my business and they may not be as evangelical like wow new technology and lets build a startup.
I	How do you think the business environmental context may increase your influence you to adopt blockchain as technological innovation?
P	So maybe I already state this before. If there is customer needs then some companies will go to adopt it. If something like central bank said like "I'm adopting this technology for a government regulatory currency" then obviously many other banks and other financial services would follow it. So yes, in some ways you can even say this is more likely to be driven by environment than anything else. If in the environment there is a clear needs or opportunity to apply blockchain then organization would apply
I	Regulation?
P	It probably has a probability to slowing down the adoption innovations in some ways, but on the other hand, it also ensures if it gets used in better way, more sustainable, the more beneficial to the customers in the end instance, so, without regulation I suspect that its likely more adoption of blockchain than particular things like cryptocurrency, I also suspect that many more people would get hurt in some ways by downside of it.
I	What is your opinion about indonesia's regulation? Does it support technological innovation like blockchain?
P	I think if you look at medkominfo, ojk, BI, is the most relevant to the financial service section. I think I would say there is a good awareness on the needs for this, there is also a good intend in wanting to facilitate to help like OJK, BI setting up for sandbox environment, I do think in certain area in the government, they still need to build their knowledge and understanding of spending on innovative technology, but that sometimes may be a barrier, because regulator has to make a judgement on the technological innovation on some company. But if they don't really have any experience with that technology yet that can slow things down. I think the general intends, willingness, etc is positive and practical steps are being taken but I also think that the gaps between regulators to strengthen their understanding to help drive innovation more.
I	How do you think about market dynamic , like competitor, market demand,?
P	For me it would be primarily market demand , again if customer need it then I would find a way, but if what they needed is not providable by blockchain then I would not need to adopt it.
I	So what is the barrier?
P	The biggest obstacle right now, I think on customer financial services that no one has yet come up with a use case which is really compliant with blockchain. The majority says that personal budgeting or personal finance is important to be solved. Some still talks about to save products, some talk more about more convenient transactions but yes e-money start to help with that, but anyway all these problems are not solved by blockchain. That I think remains the big problem. If you or your friends and colleagues do not have a challenge that could be solved by blockchain then why would I adopt it for my customer
I	Primary on selecting technology?

P	At least a good company do what I did describe. Look at your customer needs and painpoints first so you first think about what is your consumer needs, then you start to think what technology could be best to solve this problem. Not the other way around. You don't typically say, I have a technology, let me help you around ,you say instead, this person have many problem with budgeting, then what can I do with it which is more to be solved by artificial intelligence, robo advisory etc. I think that is the technology that would be more likely to help than blockchain.
I	What do you think of implementing blockchain as private or as distributed ledger?
P	The key feature

Participant 8

Position: Lead Business Strategist

Financial service type: Cryptocurrency exchange

Adoption type: Non Adopter

P	Jadi yang pertama, kalau di perusahaan aku sendiri dia digital IT developer yang sekarang sedang focus ke blockchain. Terus abis itu pertama kali dengerin blockchain tahun 2016, di history nya itu bitcoin dulu baru blockchain. Di white paper nya bitcoin itu ada basic dan technic nya, jadi alurnya kenapa dibuat bitcoin yang jadi blockchain itu karena bitcoin dulu baru blockchain. Terus kenapa awalnya dibuat tuh si blockchain karena memang kan disebutkan peer to peer electronic cash, system, jadi awalnya systemnya. Balik lagi ke pertanyaanya saya tau blockchain itu dari bitcoinnya dan tidak semua bidang itu bisa di blockchainkan, tergantung kebutuhan. Sekarang perusahaan saya sedang membuat jaringan blockchainnya. Jadi di Indonesia belum ada perusahaan yang blockchain system, walaupun ada mereka sedang menghipun dana dan modal untuk segala macemnya. Kalo adopsi nya diperusahaan aku kan crypto currency exchange jadi crypto currency itu hasil dari blockchain, kenapa hasil dari blockchain? Karena jadi kaya blockchain itu system jaringan yang menghasilkan crypto2 gitu, yang memiliki valuasi yang menilai sehingga bisa dibilang itu crypto currency. Kalo dibilang sudah mengadopsi atau belum, system jaringan didalamnya tu belum. Karena dari penyediaannya sendiri untuk mengembangkan blockchain itu butuh 3 tahun lebih, dan sekarang sedang proses bikin. Kalaupun ada di Indonesia perusahaan blockchain itu namanya vexanium. Jadi kami dengan vexanium cukup dekat, dan vexanium adalah orang Indonesia pertama yang bikin jaringan blockchain. Kalo aku ngembanginnya buat SaaS dengan kerjasama dengan mas dani. Kalo yang aku harap dari blockchain itu sebenarnya potensinya banyak yang pertama itu Telkom dan gov sedang mengembangkan blockchain yaitu untuk bekras dan land registry. Kalo di indo untuk financial services itu belum ada, mungkin kalau di luar negri bank seperti dbs, hsbc, common wealth itu mereka sudah menerapkan ya tapi hanya untuk sebagai pencatatan. JP Morgan itu sudah mengeluarkan blockchain dan crypto sebagai system internal. Mereka bikin untuk internal sytem perbankan, mereka jualannya systemnya. Biasanya kalo sudah punya system jaringan yang besar itu biasanya butuh pencatatan yang besar juga dan sampai sekarang blockchain itu cuman sampai pencatatan sih. Nah ada namanya your company itu (crowd funding) nah dia juga pakai, tapi penilaian saya yang baru sampai bener2 sudah tinggal jalan itu vexanium yang basicnya itu kan sebenarnya kayak marketing kan mereka bikin bikin voucher gitu yang namanya vex/vexanium itu sendiri yg berupa crypto.
I	Jadi sebetulnya vexanium apakah sudah mengimplementasikan blockchain di jaringannya atau pada crypto currency nya?
P	Jadi gini, blockchain itu infrastrukturnya dan crypto itu produknya. Jadi mereka punya infrastruktur nya. Jadi blockchain itu contohnya seperti ini, Jadi dia punya aplikasi untuk belanja nuker voucher. Voucher itu penukarannya kayak tokennya itu pake vexanium hasil dari jaringan Decentralized Application (D'Apps). Kalo dari financial sector yang aku tau, mereka lagi concern di gimana cara merapikan kredit sih, itu target mereka selanjutnya.
I	Kalo D'Apps itu apa sih kak?
P	Decentralized Application, jadi aplikasi itu di download yang nantinya akan masuk ke jaringan blockchain. Nah sebenarnya kan blockchain itu diciptakan supaya menghapus pihak ketiga kan. Jadi misalnya a ke b pengen ngirim duit kalo pake bank kan harus di acc dan lain lainnya, Tapi kalo pake bitcoin itu langsung sampai dan tidak perlu pakai perantara, nah kenapa bisa? karena ada kepercayaan dari a dan b ttg uang yg sampai yg dikonfirmasi di system yang membuat hal itu bisa dilakukan. Itu dibuat diatas software dan internet (istilahnya kriptografi sih kalo Bahasa IT nya)
I	Kalo diperusahaan sendiri apakah blockchain itu berguna?
P	Kalau diperusahaan aku sendiri sih tentunya pasti berguna tetapi tergantung segmentasinya apakah buat public atau buat internal. Kalo external lebih mengenalkan teknologi sih sebenarnya, misalnya ada technology baru yang mempermudah pencatatan atau deteksi asset. Nah kalo internal itu bisa meningkatkan trust kan dank arena basic blockchain itu kan trust (si a dan b transaksi tanpa adanya penengah kan) sekarang saling percaya. Itu kenapa blockchain itu Bahasa lainnya trust ledger, karena benar2 dibuat berdasarkan trust.
I	Kalo DLT sama blockchain itu sama aja atau gimana sih?
P	Itu part of nya sih, Blockchain itu definisi besarnya dan DLT itu komponennya

I	Menurut kaka kelebihan blockchain dari pada technology yang ada apa sih? Maksudnya apakah berpengaruh dengan keinginan orang mengadopsi?
P	Blockchain itu dibuat dan ada karena dia secure dan sampai sekarang belum bisa yang ngebajak dan nge hack. Jadi kalo missal ada media yang bahas “ini crypto currency dibajak” nah itu bukan blockchainnya yang dibajak. Misal, satu transaksi itu kan ada sekian banyak ribu konfirmasi dan blok blok gitu nah itu gabisa diputus rantainya, kalo diputus satu rante nanti orang masih punya buktinya. Nah kenapa pemerintah udah bisa melirik nih, nanti rencananya mau dibuat di pemilu. Nanti satu TPS jelas gitu loh (missal tps 13 ngisi x suara yang nanti langsung ke update ke pusat. Tapi tps lain juga bisa mengonfirmasi jadi kecatet gitu) Nah contoh tersebut namanya blockchain.
I	Jadi dengan benefit tersebut ya kak yang memengaruhi keinginan untuk mengadopt blockchain ya?
P	Iya, memang harus di adopsi karena sudah gaada jamannya kita harus ke pihak ketiga dulu. Nah contohnya di akutansi kan kita harus kan harus ngumpulin informasi dulu dan mencatat catet ttg uang dan audit audit seperti itu kan harus ngumpulin data dari pihak kedua nya. Contoh lainnya adalah online pajak kan dia bisa online pajak pake blockchain and ada perusahaan yang nge provide. Memang itu produk departemen keuangan jadi orang isi online pajak langsung keisi kedaftar dan keisi semuanya.
I	Apakah blockchain susah untuk digunakan dan dimengerti kak?
P	Digunakan gampang tapi kalau dimengerti sulit memang. Karena sekarang untuk produknya sendiri masih jarang, jadi susah dilihat memang. Karena blockchain itu jaringan, bukan kaya IoT atau cloud computing yang langsung kelihatan barangnya. Kalau blockchain itu 1a 1b c d e harus connect. Itu kenapa pkalau dipemerintahan itu banyak kementerian yang bertanggung jawab. Contoh land registry saja membutuhkan badan pertanahan, pajak keuangan, perdagangan yang mereka semua harus sinkron. Kalau yang aku lihat pemerintah mengincar konsersium blockchain yaitu menunjuk suatu pihak untuk mengonfirmasi dan penanggung jawab
I	Kalau kompleksitas dari implementasi blockchain itu menghambat adoptionnya ga?
P	Ngga sih karena basicnya blockchain sekarang pengembangannya sih lebih kompleks dari adopsinya. Tapi kalo udh adopsi nih orang udh tinggal pay with bitcoin, dari wallet, dari atmnya kalau di dubai, nah kalau sudah adopsi sudah tinggal pake saja.
I	Kalau bentuk user experiencenya emang berbeda ya kak kalau pake blockchain
P	Iya lebih terbuka, istilahnya informasinya lebih banyak. Contohnya misalnya pertama masalah data ya. Itu kenala ada private blockchain consersium blockchain dan public blockchain. Biasanya private blockchain itu KYC nya sangat cepat dan orang yang masukin data itu mengalir dengan sangat cepat (diolah) dan mereka punya privacy policy untuk data yang masuk kedalam jaringan dan system itu harus aman, makanya di lembaga keuangan terutama, kenapa Indonesia masih belum, karena mereka melihat KYC nya itu jadi tepat mestinya. Sama saja seperti di perusahaan KYC nya seperti daftar bank dan fintech harus ttd dan foto diri. Nah itu kenapa bener2 harus dijaga data diri seseorang, karena jika bisa terjadi data bocor dan keluar itu bisa terkena kasus. Itu yang secara adopsi sebenarnya tergantung jenis blockchain sendiri
I	Kalo menurut kaka blockchain itu relevan dan kompetible kah untuk suatu perusahaan di Industri keuangan?
P	Sangat kompetibel sih khususnya blockchain itu dibuat untuk di Industri keuangan, contohnya bitcoin itu sendiri kan kan peer to peer electronic cash, walaupun bitcoin bukan merupakan merupakan alat pembayaran dan itu diibaratkan seperti emas. Kalo dibaca dari white paper pertamanya satoshi nakamoto dia bilanganya peer to peer cash system, bukan payment. Jadi bukan buat bayar, sementara kalo bayar pake bitcoin itu di wallet di scan tapi bisa jadi 60 menit, nah kan lebih lama karena missal sekali confirm itu bisa 10 menit, tapi untungnya tidak ada potongan dan lebih murah jatohnya. Yah memang plus dan minus. Itu kenapa facebook dengan project libra/blockchainnya itu sangat semangat mengerjakan prject itu.
I	Problem apa sih dari financial industry yang sangat cocok untuk di tackle dengan adanya technology blockchain?
P	Kalo menurut saya KYC. Jadi gini, industri keuangan itu sangat konservatif. Jadi bahkan calon nasabah untuk mau mendaftarkan mereka masih ragu-ragu dala mendaftarkan diri karena masih ttd basah lah fotokopi KTP lah dll, itulah kenapa blockchain bisa dibuat ketika mendaftar misalnya, ketika buka tabungan online dan mengisi data dengan app yang mengisi data sidik jari misalnya, nah itu bisa langsung di konfirmasi dengan data kependudukan yang terhubung dengan blockchain.
I	Aku juga pernah denger sebuah organisasi (one me identity) ngomongin tentang ini kak itu bagaimana ya?
P	Jadi asosiasi itu menyarankan Indonesia terutama pemerintah, sebelum ngomongin ttg KYC itu benerin system kependudukan nya (keuangan dan catatan sipil) biar ga susah kalau mau buat baru dan mengganti

	atau update tanggal. Kalau blockchain sudah di implementasikan kan tinggal ubah dan di data sistim kependudukan wilayahnya tinggal konfirmasi dan ubah
I	Jadi menurut kaka peran dari perusahaan terhadap pengadopsian technological innovation dalam konteks blockchain itu bagaimana kak?
P	Pasti tentunya satu SDM, yang paling berasa tentunya yang paling berasa ketika blockchain itu expertisennya masih belum ada, walaupun blockchain itu berasal dari pengembangan dari beberapa ilmu yang bisa disatukan dan jadi blockchain. Contohnya pelatihan departemen IT yang dikasih pelatihan dari oracle misalnya atau github misalnya dll itu bisa jadi ilmu yang baruu. Walaupun dari perusahaan sendiri jadi keluar expense buat pelatihan. Namun di Indonesia sendiri blom bisa kita menarik secara role blockchain developer itu karena memang belum ada.
I	Kalo dari kesiapan Infrastruktur dan finansial itu berpengaruh kah kak?
P	Pasti berpengaruh. Tapi kalo infrastruktur sendiri pasti berbanding lurus sama finansial, nah tergantung fokusnya. Tapi orang2 pasti fokus ke SDM dulu karena fokusnya dan basis ngoding dan jadi perusahaan fokusnya dari SDM dulu sih
I	Kalau dari Top Management Support tuh ngaruh ga kak?
P	Ya memang pasti berpengaruh, karen biasanya kan depan top management kita ngasih tau kita buat apa nih fungsi2 nya, basic nya sebelum ada proyek harus dikasih tau proposalnya, impact lebih jauhnya jaringannya buat seberapa lama, memang top mangement pasti support sih tapi setelah itu tinggal eksekusinya mauapa dulu, mau sdmnya dulu apa infrastukturnya dulu atau lain sebagainya
I	Kalau menurut akka besar kecilnya perusahaan ngaruh ga terhadap inovasi teknologi blockchain?
P	Ngga sih, buktinya di libra (facebook) aja kita bisa gabung jadi konsorsiumnya. Beratnya bukan jumlah dan besar karyawan, tapi lebih ke revenue perusahaannya berapa, masuk ke dalam forbes top 500 perusahaan di dunia gimana, revenue worldwidennya gimana. Bisa juga sih university nya dari mana ya, tp tergantung. Yang pasti bukan jumlahnya orangnya ya.
I	Menurut kaka seberapa pengaruhnya sih faktor business environmental terhadap/ untuk sebuah perusahaan untuk mengadopsi blockchain?
P	Business environmentnya itu hmm, kayaknya sih gaada, kalo untuk internal. Malah gaada yang berubah bahkan, mungkin sosialisasi aja kalo kita ada jaringan baru nih, nanti softwsarenya bagaimana. Begitu aja sih sepertinya
I	Kalau dari regulator/ peraturan pemerintah bagaimana?
P	Kalau blockchain gaada, kalau crypto banyak. jadi yang pemerintah liat itu di peraturan pemerintah bappenti no 99 2018 itu di kementerian perdagangan itu rata2 regulasi ttg peraturan perdagangan aset cryptocurrency. Pesan buat teman2 juga nih kalau mau coba investasi di crypto itu harus hati2. Jangan sampe karena tau dia crypto itu harus di cek siapa penyediaanya. Misal perusahaan crypto, dia pasti juga ngaku perusahaan blockchain tapi kita gatau produk blockchain nya ada apa ngga, jadi untuk blockchain sendiri masalah regulasi mungkin ngga ada tapi yg sedang crypto sendiri sekarang sedang di godok regulasinya. Karena pemerintah sendiri positif liat teknologinya
I	Kalau dari kayak kompetitor dan hype dari teknologi dan market demand itu ngaruh ga dengan intention perusahaan dalam pake blockchain?
P	Jadi kalo masalah, kalo aku sih liatnya bukan ngebentur. Karena blockchain masih jarang, jadi kompetitor bisa jadi konsorsium malah masuknya jadi konsorsium bukan kompetitor. Contoh visa dan mastercard kan kompetitor, tapi mereka masuk dalam konsorsium nya facebook, berarti ada suatu sinergi lah ya buat sama sama membangun jaringan itu sendiri yang diajak facebook, jadi bukan maslah tapi ada misi tersendiri.
I	Dari semua faktor tadi, menurut kaka yang paling berpengaruh membuat perusahaan dalam mengadopsi blockchain itu apa ya kak?
P	Memang dari technologynya sih, karena kebutuhan, ujung2 nya karena efisiensi. Pertama pa yan bisa di efisiensikan, jaringannya apa yg bisa di efisiensikan, pengembangan blockchain lebih menguntungkan kah? begitu
I	Kalau challenge dan hambatan dalam adopsi blockchain apa ya kak?
P	Perusahaan ya? paling masalah dalam pengembangan aja sih dan satu lagi yaitu SDM itu paling penting, jadi mengembangkan blockchain tidak semudah mengembangkan aplikasi. jadi benar2 teliti, jadi yang aku baca dia benar2 sangat fokus dalam jaringan itu sendiri. Dia bener2 ga keluar rumah untuk fokus dalamnya sendiri. Si vexanium itu di push RnD nya.
I	Itu Vexanium beneran bikinan orang Indonesia ya kak?
P	Iya, basic nya itu ketika orang ingin orang ingin mendirikan blockchain itu dia mengumpulkan dana, nah dananya itu namanya ICO, itu kita liat dulu ijinnya dimana. Rata2 perusahaan indonesia itu ijinnya

	singapur, registerednya singapurtapi tempatnya disini karena disini belum ada regulasi ICO disini. Bahkan jadi perdebatan disini, karena kalo bisnisnya bener dll itu gajadi perdebatan, tapi kalau ada scam itu bisa jadi perdebatan.
I	Kalau menurut kak masa depan blockchain di Indonesia itu bagaimana?
P	Sangat cerah si sebenarnya dan masih banyak dan panjang dan harus di teliti lagi, untuk saat ini blockchain masih jadi basicnya aja untuk penerapannya. Belum jadi sangat krusial, karena orang tau blockchain lagi2 crypto lagi2 crypto. Tapi balik lagi karena basicnya kegunaan blockchain itu dicrypto. Nah negara liat blockchain ini kayaknya di financial sektor nih, tapi mau dibagian mana apa?
I	Emang harus paling efektif tuh kalo ada cryptonya ya kak?
P	Jadi kalo ngomongin blockchain di financial sektor itu pasti baliknya ke crypto. Karena blockchain di financial sektor itu pasti jadi sistem pembayaran yang menggunakan cryptonya itu. Kita contohnya balik ke libra lagi aja ya, kenapa pemerintah di dunia masih mikir2 pake libra, karena basicnya crypto itu (system keuangan yg crypto itu) dibuat untuk menghilangkan peran bank central. Itu yang menjadi sisi negative dari pemerintah, jadi gaada segi pengawasan dari pemerintah. Itu yang jadi concernnya sampai sekarang. Memang secara teknologi bagus dan liar. Tapi sebagai regulator itu gabisa di liat dan deketsi ya begitu jadinya.makanya masuknya pertama kali kkomoditas.
I	Berarti kalo di indonesia itu projectnya yg bener2 blockchain itu vexanium ya kak?
P	Ya kalo menurut aku yang bener2 ada jaringanya snediri itu baru dia.
I	Ada gasih kak keuntungan centralized dari pada decentralized?
P	kalo centralized memang sebenrnya, sbetulnya itu berhubungan sama legal aja sih. Jadi memang kayak kalo gasaah ya blockchain dari industri perminyakan itu gabagus karena banyak yang harus di atur dan di sertifikasi. Jadi kalo decentralized yan tidak diatur itu akan jadi berantakan. Tapi kalau sebagai sistem pencatatan aja bagus. untuk mempermudah aja gausah catet sana catet sini. Terutama maslah digital signature, memang lagi banyak juga kan diomongin. Nah blockchain juga bisa dipakai di digital signature.
I	Kalau menurut kaka blockchain itu bagus untuk perusahaan dengan bisnis proses yang kayak gimana?
P	Di perusahaan untuk yang terlalu ribet, terutama dimasalah pencatatan dia harus ada orangnya sendiri. Jadi gini, blockchain itu bagus untuk perusahaan yang memang internal auditnya selalu berjalan. Diatasnya itu menurut saya yang paling bagus itu sebenarnya buat audit ya, karena kalau audit kita bisa tau nih divisi a b c itu pencatatannya gimana, dan mempermudah audit juga sih sebenarnya.
P	Blockchain itu sebenarnya untuk di kantor yang ada divisi intelligencenya ya, nah yang analyst nya itu rada susah karena blokchain itu inputnya manual, dan jaringannya udah kemana2. tapi di periksanya sama orang lain, Jadi susah buat ngecek data angka itu rada sedikit susah, nah itu blockchain. Jadi ini nanti next yang jadi concetn indonesia itu Batam. Batam itu economic zone yang punya regulasi sendiri dll yang emang lagi fokus kesitu dan sangat concern ttg regulasinya. Tapi emang kalau emang dilihat sekarang lagi banyak cashless society, banyak banget aplikasi yang emang ttg keuangan, bisa aja sih lebih pesat kemajuan teknologi terutama di blockchain, awlaupun perlu di tes. Kita juga masih nunggu peraturan di bappetti yang baru mulai 2020 sih nah kita sebagai perusahaan juga masih ngelihat sih.
I	peraturannya kayak gimana sih kak?
P	Sebenarnya lebih ke perdagangan aja sih, soalnya kan transaksi di kripto itu besar sekali kan dan bahkan saham aja ga sebesar itu. Lucunya orang saham aja tuh kaget kok bisa secepat dan sebesar itu dan FYI perdagangan krypto itu tiap hari gabisa tutup dan ga tutup. Dan itu yang harus di awasi. blockchain itu gabis mati blockchain itu dimatikan dengan ujungnya, jadi itulah kenapa blockchain dibilang paling secure, jadi kalau satu node itu ilang datanya, bisa balik lagi dari karna ada konfirmasi yang lain. Tapi bagusnya ada yang nanganin kyk gini. Karena kenyataannya kita coba ngasih pendidikan dan sosialisasi ke bank atau kemana gitu, pasti yang ditanyain itu produknya, nah susahnya karena emang produknya itu ga keliatan atau memang belum ada sih sistemnya kalo ga dicoba, karena emang sekali ngebangun bener2 harus dipake dan gamungkin cuma buat test-drivce aja.
I	Jadi kalo saat ini perusahaan tuh produk yang bisa ditawarkan tuh apa?
P	Ya paling kayak exchange aja sih untuk saat ini, iya sama kayak indodax, dia jauh lebih dulu dan lebih tua 5 tahun sih. Cuman ya gitu banyak sekali perusahaan blockchain yan menawarkan produk cryptonya itu buat jual di perusahaan. Kan kami harus filter dong karena gabisa sembarangan produk itu masuk di perusahaan. Nah itu juga yg di jaga sama pemerintah, jangan sampe yang mereka bilang blockchain itu cuman buat jualan asset doang.
I	Jadi kalo perusaah crypto exchange itu gapake system blockchain dong kak?
P	Kalo internal sih ngga, tapi kalau external ya pake buat di public cryptonya. cuma sekarang yang udah advance itu paling baru JP morgan sih.

P	Tapi memang kalau exchange itu di indonesia bukan sebagai kompetitor sih kita menganggapnya. Jadi gini, istilah crypto currency exchange itu dia kayak bursa saham. Jadi harga bursa saham itu kan dia ditentukan sama supply demand. Jadi ya tergantung publik, jadi yg nentuin mereka. Begitu juga harga crypto. Misal nih ada orang beli crypto di perusahaan 2. Orang bisa beli crypto di perusahaan 2 jual di perusahaan itu, itu yang kenapa pemerintah sangat concern, kalo bahasa nya itu arbitrage itu bisa berubah2 gitu dan transaksinya gede dan karena nilainya yg berubah2 itu maka di sinkronin lagi sama pemerintah. Oalah total di indonesia itu ada 14 exchange dan yang anggota asosiasi itu da 14 juga termasuk vexanium. Karena sangking banyaknya exchange orang/ public bisa kemana aja, bawa uangnya, transaksi dimana saja dan tergantung supply demand an harganya.
I	Apakah ada saran lagi ngga kak?
P	Kalau misalnya buat technologynya coba deh hubungin yang namanya teguh harmanda. Kebanyakan mereka semua di jakarta sih. Bilang aja dari musa. Dia itu adalah ketua ethereum di indonesia dan dia secara technical lebih mengerti sih. Orang nya sih rada sibuk, dia secara technical lebih ngerti sih dan dia itu emang orang IT makannya tau dari awal. Dia juga CTO dari salah satu perusahaan crypto dan yang buat blockchain nya. Coba cek dan di hubungin di linkedin deh, coba aja di hubungin soalnya orangnya beneran ilang2an hehe
I	Ok terimakasih banyak ya kak!
P	iyaa

Participant 9

Position: Lead Business Strategist
 Financial service type: Cryptocurrency exchange
 Adoption type: Non Adopter

I	Apakah tau tentang blockchain dana pa saja yang diketahui?
P	tau sejarahnya nggak? Jadi ini awalnya kalau diruntutin ya pada saat tahun 2008 itu semua negara itu kan kena financial krisis termasuk Indonesia jg. Pada saat financial crisis itu bukan keadaan krisisnya yang ditakutkan, tapi keadaan bagaimana respon dari masing-masing negara tersebut. Indonesia saat itu cukup baik masih bu Sri Mulyani itu masih oke. Nah tapi beda dengan America, saat itu mereka agak merespon berbeda, mereka merespon dengan mencetak uang sebanyak-banyaknya untuk bisa menutupi utang dll, dan yang terjadi adalah inflasi. Pada saat proses inflasi itu, ada orang atau pihak yang suka disebut dengan satoshi lah tapi kalo saya bilang itu adalah sekelompok orang yang kemudian sebenarnya mereka ini sudah tidak percaya dengan otoritas terpusat. Jadi kalo misalnya Bahasa kasarnya adalah gimana caranya bikin negara baru, saya gak percaya negara ini, tapi mereka gabisa melakukan itu kan. Yang mereka lakukan adalah mereka membuat suatu teknologi, mungkin yang lebih menuju ke produknya ya. Nah kalo ada pertanyaan blockchain sama bitcoin itu duluan mana? Bitcoin dulu, soalnya masih banyak yang suka salah karena memang di tahun ini mereka itu yang mereka buat itu produknya dulu, yang mereka buat itu si bitcoinnya. Nah itu yang mereka pake. Kegunaan utama dari bitcoin itu dia menghilangkan ketergantungan dengan otoritas terpusat. Terus yang kedua itu mereka menghapuskan ketidakefektifan yang terjadi di dunia nyata. Kenapa apa yang membuat tidak efektif? Nanti ada di beberapa slide terakhir. Apa itu cryptocurrency? Ini gambaran gampangya lah, cryptocurrency itu dia adalah mata uang, sebenarnya bukan mata uang ya, dia adalah produk dari proses kriptografi. Proses kriptografi itu adalah dia semacam protocol untuk mengamankan data. Ketika saya mengirimkan dari saya ke kamu, pada saat saya transfer, ketika ada orang yang mau ambil data di tengah, bisa aja kemungkinan data itu diambil, tapi ketika data itu diambil kita gaakan bisa baca karena prosesnya kita melakukan proses kriptografi tadi, jadi saya encrypt datanya jadi dia gabisa baca. Nah kegunaannya pertama dari cryptocurrency adalah pertama mereka distribusi buku besar, mereka ga lagi centralized. Kemudian yang kedua, mereka itu peer to peer, jadi saya ngirim langsung ke kamu, gaada lagi yang namanya bank. Nah contoh kalo di Indonesia, di BCA gitu lah ya, itu tinggal dari BCA ngeshifting doang. Tapi bagaimana kalo saya misalkan ngirim dari Indonesia ke luar? Ini ada proses yang namanya kliring internasional yang makan banyak waktu. Ini yang kemudian, gimana caranya ini bisa disolve, kemudian lahir yang namanya si blockchain itu tadi. Dalam hal ini, diwakilin lah sama dengan yang disebut bitcoin itu tadi. Peer to peer jadi dari A langsung dikirim ke B. tetapi tetep ada yang di tengah, yang di tengah itu bukan sebagai intermediary party. Kalo disini ada bank, bank itu punya office hour dan mereka punya database sendiri2, ketika databasenya diambil dicuri, hilang ini semuanya. Tapi kalo disini (miners), ini jumlahnya ada 180 K skrg bahkan lebih, ini jadi seperti database, jadi mereka ini yang berguna untuk melakukan validasi terhadap seluruh transaksi yang ada. Jadi ibaratnya mereka ini (miners) kaya saksi lah. Misalnya saya ngirim sesuatu ke kamu kemudian saya bilang kalo saya udah kirim padahal sebenarnya gak saya kirim terus kamu bilang kalo kamu gak terima gitu. Nah adanya mereka (miners) adalah untuk melakukan dan melihat historical dari transaksi yang ada. Mereka gabisa mencuri data yang ada. Nah itu tadi, proses kriptografi tadi, itu kan datanya saya encrypt terus kemudian kirim, nah miners ini hanya bisa melakukan validasinya tok. Nah prinsip dari cryptocurrency adalah dia itu store of value, jadi kalo kita ngomong uang, uang itu ada time value of money yang nilainya pasti akan berubah. Tapi kalo namanya asset pasti nilainya akan naik dan turun, mereka nyimpen value dan bukan nyimpen harga. Jadi kalo baca, ada orang yang bilang kalo teknologi blockchain itu luar biasa, sebenarnya nggak. Masih banyak hal yang jadi kekurangan di blockchain itu tadi. Masalah yang pertama adalah ini tadi (miners), kalo mereka tidak melakukan validasi data itu dianggap tidak sah. Transaksinya itu dianggap tidak jadi atau batal. Maka kalo harusnya ada mereka, mereka ini mengoperasikan yang namanya supercomputer, makanya kalo suka denger ada yang namanya mining, mereka yang sebenarnya miner. Jadi mereka itu mendapatkan reward dari proses validasi yang dilakukan. Nah, bitcoin blockchain itu didesain untuk insentif, makanya semakin insentif yang dikasih semakin besar, maka proses validasi juga akan lebih cepet. Terus kemudian saya mengatakan kalo bitcoin itu

seperti Blockchain 1.0 , ibaratnya mereka yang menginisiasi si blockchain itu tadi. Jadi kan bitcoin kecepatan mereka validasi juga semakin lebih cepet. Jadi bitcoin itu kan udah gabisa diapa2in. nah ibarat saya mau bikin kue nih , kalo saya mau bentuk jadi adonan itu kan bisa saya bentuk ke kue2 lain kan. Nah ini si kue yg enak tadi, saya ambil intisarinnya kemudian saya ramu, apa sih yang ada di dalamnya ini tadi, kemudian saya buatlah yang namanya teknologi blockchain. Nah kemudian teknologi blockchain ini berkembang, ada yang namanya ethereum, pernah dengar? Ethereum ini digunakan untuk membuat semua aplikasi yang ada, tapi sifatnya decentralized. Contoh, kamu misal install tokopedia atau bukalapak, pada saat kamu belanja disana otomatis semua historical transactions kita itu disimpan di mereka. Mereka punya semua data kita, makanya kemaren sempet ada issue kebobolan data lah. Nah itu karena mereka databasenya centralized. Nah kemudian apa yang bisa dilakukan oleh teknologi blockchain ini tadi? Mereka menyimpan datanya itu sifatnya decentralized, ada di banyak orang. Jadi di banyak orang ini sifatnya seperti database. Tetapi bukan nyimpen datanya loh ya, mereka hanya menyimpan historical transactionnya. Jadi gini contohnya, misal saya mau belanja. Ya kan kalau belanja di tokopedia, memang data saya kesimpen di tokopedia. Nah tapi historical dari transaksi belanja saya itu akan tersimpan di blockchain juga. Ya itu bisa two ways lah, atau bisa sama sekali gaada data yg centralized, semuanya akan tersebar. (tersebar nya itu ke siapa aja?) itu yang namanya nodes atau yang bahasanya miner. (kalo node itu maksudnya gimana sih?) Kalo node itu mereka yang melakukan proses validasi. Jadi gini, ada orang yang kemudian orang itu melakukan transaksi data. Pada saat dia melakukan transaksi data berarti dia butuh orang yang akan melakukan proses validasi, nah pada saat di melakukan transaksi data, maka si historikalnya ini tadi atau proses transaksi ini akan dilempar ke network. Nah, ibaratnya ini kaya lelang. Makanya kalau lihat Bahasa saya, gini, semakin bayar tinggi maka cepet. Maka contoh ada orang A dan B ngasih biaya transaksi 5000 perak. Terus ada orang yang transaksi lagi yang feenya 20 ribu, pasti yg dipilih yang lebih gede kan. Otomatis yang 20 ribu yg diduluanin. Jadi siapakah nodes ini? Nodes adalah kita yang bisa melakukan proses validasi. Apa limitasinya lagi dari blockchain? Yang pertama adalah scalability, tau tps gak? Bitcoin itu hanya 7 tps. Jadi bitcoin itu selama itu. Jadi bandingkan antara bitcoin sama visa kartu kredit. Jadi visa itu hanya mengakomodir sampai 25ribu transaction per second, sedangkan bitcoin hanya bisa mengakomodir 7, bayangkan betapa lamanya itu , lama banget kalo dibandingkan dengan pihak yang bisa melakukan 25 ribu transaksi. Kemudian yang kedua itu adalah interoperability. Interoperability ini artinya adalah blockchain di luar sana, ada ethereum, neo, dll. Nah sebenarnya semua blockchain ini gabisa saling berkomunikasi. Contoh saya bikin aplikasi di ethereum, nah terus kamu pake yg lain.. misalkan saya bikin aplikasi gojek , kamu bikin aplikasi payment gateway. Tapi kita beda blockchain, itu kita gabisa saling integrasi. Itu yg namanya, interoperability, blockchain is isolate, cannot communicate with each other. Kemudian yang ketiga tentang environmental, yang tadi, untuk bisa melakukan proses validasi tadi, si node ini harus ada computer. Nah untuk mengoperasikan super computer dia membutuhkan ultra high electricity consumption. Nah ini menjadi satu masalah yang sekarang masih dicari gimana cara ngesolve ini tadi. Lantas muncullah evolusi yang baru yaitu blockchain 3.0 dimana 3 masalah tadi coba diselesaikan. Misalkan, scalabilitynya sekarang antara Zilica dan Iota udah bisa sampe 2000 tps. Nah kalo tadi bitcoin itu 7tps dan ethereum itu 15 tps, kalo di zilica itu bisa sampai 2000 tps. (itu tergantung dari jumlah minernya?) sebenarnya itu tergantung dari topologinya, yang kedua itu bener tergantung minernya, terus ada juga yang disebut consensus. Consensus itu yg skrg Libra, jadi org bisa jadi leader dari consensus, ibarat kaya polling lah, jadi misalkan ada 10 orang lalu memilih kamu jadi key person untuk bisa ngevot, jadi istilahnya mewakili banyak orang. Nah kalo sekarang ini misalkan 11 orang dgn komputernya, nah 11 nya ini gajalan, tapi diringkas jadi 1 orang, kemudian diwakilkan satu orang, nah satu orang ini yang melakukan proses validasi. Nah itu nanti maksudnya ke environmental, itu namanya proof of stake, jadi dia nge stake ke atas kemudian org yg berada di atas itu yg membantu proses validasi. Ketika mendapat reward maka reward itu akan dibagi rata. Karena kan misalnya saya email kamu, terus kamu dapet keuntungan nah bagi hasil kan kita. Selanjutnya, kalo saya pribadi bilang kita ini masih di Blockchain 2.2 , kitapun masih prematur lah both di indo maupun di luar apalagi di indo. Kemudian kita berpikir Blockchain 4.0, maka bagaimana regulasinya? Apakah dianggap sebagai commodity asset dan atau security? Kemudian ada lg mass adoption pertanyaan , ngapain kalo ada teknologi canggih2 amat, tapi gaada yang make, kan itu pertanyaannya. Nah terus bagaimana outlook dari changing business industry. Sebenarnya kan kita kan ada di fase di tengah ya. Kalo saya masih ngerasain dimana kalo saya cari hotel saya mesti
--

	datengin dan nanya masih ada kamar atau nggak. Jaman sekarang nggak, tinggal buka Airbnb atau traveloka untuk tau apakah masih ada kamar di kota ini atau nggak. Nah, semua ini kan transformasi. Jaman sekarang, jangan pikir kita udah efektif nih ada grab ada gojek, sebenarnya kita bisa buat itu lebih efektif lagi, ini langsung real casenya ya. Gojek, saat kita order go food, saya bayar 10 ribu nih ke merchant, gojek itu motong 20 % untuk ke merchant which means kalo saya bayar 10 ribu, berarti 2 ribu untuk gojek dan 8 ribu untuk merchant. ya memang gitu, gaada yang salah dari itu karena itu memang business model dari gojek dan menurut saya itu bisa masuk topik kamu, karena pada saat gojek ngecharge kan dia ada yang namanya beban operasional gojek, seperti biaya pekerja terus server yang costnya itu gamurah, makanya mereka butuh yang namanya business model. Nah, kalo kita pake blockchain, kita bisa reduce dan kita bisa buat proses ini lebih efektif. I mean kalo tadi saya bilang ada 8 ribu yang kemudian di kasih oleh gojek otomatis ada margin 2 ribu ini, kemudian dr 2 ribu ini saya ngembalikan ke customer dan si seller. Contoh, tadi saya mesen 10 ribu, dari 10 ribu kalo pake blockchain, saya sebenarnya cukup bayar 9500 itu satu. Nah kemudian si merchant dia bisa dapet 9000, itu aja saya masih dapet untung 500 perak. 500 itu bisa untuk platform, makanya saya sudah bilang. Saya tinggal nunggu nih, nanti pasti ada jaman dimana gojek itu sifatnya decentralized. Kalo skrg gojek ini skrg masih sifatnya centralized, tapi memungkinkan kalo ada aplikasi yang menggunakan decentralized. Kalo menurut saya itu menarik ya kalau ada pihak yang bisa membuat platform yang sifatnya decentralized. Kenapa akhirnya bisa jadi lebih murah? Karena misalnya gini misalkan gojek yg sifatnya decentralized, saya gabutuh karyawan yang banyak, aplikasi saya udah jalan dengan smart contract. misal, Saya udah pake smart contract, saya udah pake blockchain, kemudian apa yg saya perlu, kemudian server udah decentralized istilahnya semua udah kebagi untuk banyak pihak yaitu ke miner kalo misalnya saya public. Namun, kalau saya private, otomatis ya ke pihak2 yang saya tunjuk. Menguntungkan atau tidaknya depends karena setiap project itu beda, makanya ada jg yang nanya saya, bagaimana saya menentukan mau make private atau public atau consensus. Lalu saya bilang, identifikasi dulu dari business modelnya. Jadi justru jangan decide di awal, misal di awal bilang kalo yg dibutuhkan adalah private tapi kenyataannya yang dibutuhkan adalah public, begitu jg dengan yg private blockchainnya. Jadi jangan tergesa2, misalkan bilang ethereum kan yang paling terkenal maka pake ethereumnya, jangan gitu juga. Diliat lagi, karena fungsi blockchain itu kan beda2, ada yang multi signature, jadi kaya misalnya hanya untuk ngesign itu kan jd lebih mudah platformnya. Jangan buru2 yaudah pake blockchain, nah blockchainnya apa dulu, konsensuskah, private kah atau public terus kemudian platform blockchainnya apa dulu, baik ethereumkah, ada yg namanya nem dll. Nah ada di Indonesia yang ngembangin blockchain sendiri, tapi terus terang kalo dari saya sendiri sih kalo udah ada yg ngembangin ngapain buat sendiri karena istilahnya buang resource lah. Crypto itu sekarang dianggap sebagai commodity. Commodity itu diatur di peraturan 99 tahun 2018. Terus kemudian di bapepti no 5 thn 2019. Jadi sebenarnya ini 3 besarnya, ada public, consortium atau consensus, dan private. Kalo public siapapun bisa masuk ke dalamnya, kalau consortium itu dipilih, dipilih dengan spesifikasi tertentu. Jadi contoh, saya bisa masuk ke dalam networknya ini. Jadi contoh libra, setiap orang mau jadi nodenya, orang itu harus bayar 10 juta dollar, dan mereka membatasi itu cuma 100 nodes. Kalau private, dari awal mereka udah menentukan siapa aja yang menjadi nodenya di private itu.
I	Apa saja product dan service di perusahaan?
P	Di perusahaan kami adalah exchange cryptoasset dimana kami menjual dan membeli crypto asset ethereum, bitcoin, total kami ada 10. Tujuan kita adalah kita ingin menjadi stable coin hub yang ada di Indonesia. Jadi orang bisa membeli koin itu yang nilainya lebih stabil. Mungkin pernah denger, koin itu ada 3 jenis. Ada yg namanya utility token (contoh vexanium), kemudian ada yang namanya asset back token, dan yang terakhir ada namanya security token. Utility token itu bener2 ditentukan oleh supply dan demand. Semakin banyak utilitynya dipake otomatis demandnya makin banyak, sedangkan supplynya kan fix, makanya harganya makin naik. Kalo asset back token itu 101, contoh saya punya satu token dimana harga satu token saya sama dengan aqua. Pertanyaan saya, saya tiba2 ngejual satu token saya seharga 50 ribu ke kamu. Apa kamu mau? (nggak) karena mahal kan, karena aqua biasanya 5 ribu kan. Sama kaya emas, ada di perusahaan kami, kami ngejual namanya digix, satu token digix seharga 1gram emas. Jadi gamungkin harga digix tbth seharga satu juta, sedangkan sekarang harga emas kan kaya 600an kan. Itu namanya asset back token, jelas, harganya stabil. Yang ketiga ada namanya security token, security token itu seperti stock. Jadi misal saya punya bisnis, terus saya mau mentokenize. Ketika bisnis itu generate revenue

	dan dia punya profit. Maka saya, sebagai yang punya token saya akan mendapatkan share dari profit tersebut. (kalau stable coin itu gimana?) Stable coin itu sama seperti asset back token tadi. Jadi asset back token adalah token yang di backup oleh asset tertentu, ada underlyingnya sehingga harganya jadi lebih stabil.
I	Kalau di perusahaan, ada teknologi apa yg incorporated dgn perusahaan?
P	Kita platformnya dibuild dari awal, kita bener2 build dari awal, soalnya ada beberapa exchange yang beli dan itu yang berbahaya. Karena apa? Kita bener2 gatau tentang code didalam nya mereka bikin kaya backdoor kemudian makanya kadang denger ada exchange yang kebobolan, ya itu tadi karena adanya backdoor dan kalo di kita, kita teknologinya kita pake yang terbaru, dalam arti kata semuanya serba baru. Kita membuat platform di platform yang paling baru, saya lupa namanya FUJS atau ReactJs ya, pokonya teknologi baru dari segi platformnya. Kemudian kita juga menggunakan utility server pake AWS. Tapi bukan amazonnya aja, kita juga pake web service yang ada di dalamnya. Karena itu banyak bgt yg bisa digunakan. Teknologinya itu teknologi terbaru kemudian dompetnya kita itu pake walletnya itu custodiannya namanya BitGo. Kita beneran ingin memastikan kalo customer kita itu mendapatkan yang terbaik lah. Nah kita emg purely dari Indonesia.
I	Berarti secara platformnya, apakah menggunakan blockchain di perusahaan?
P	Oke, saya bisa bilang bahwa agak susah kalo exchange menggunakan blockchain decentralized semuanya. Gini, jadi exchange itu tetep butuh centralized. Kenapa? Karena mereka itu mengelola semua transaksinya itu satu. Kedua, ada bagian-bagian yg kemudian butuh campur tangan manusia. Itu kenapa makanya wallet kita pake smart contract. jadi walletnya ethereum itu pake smart contract. tapi untuk platform jual beli itu sifatnya masih centralized. Jadi ga pake blockchain untuk platformnya kecuali walletnya.
I	Keuntungan wallet pake smart contract>
P	Oke jadi pencatatannya. Jadi, yg namanya smart contract....(itu ada jawabannya)
I	Ekspektasi penggunaan blockchain lainnya di perusahaan?
P	Untuk ini KYC, terus kemudian settlementnya, oke mungkin tetep ada action. Tapi settlementnya pencatatannya pake blockchain, jadi mungkin kita akan berkembang kesana sih.
I	Menurut anda, bagaimana blockchain akan berguna pada financial service?
P	Financial service itu kan sifatnya trustless ya, transparan auditable. Jadi semua data atau transaksi yang ada itu tdk bisa diubah. Jadi kalo kita ngomong ke finance, data yg ada di blockchain itu sifatnya akan mutlak jadi data itu tidak bisa dihapus. Di blockchain, prinsipnya hanya ada dua, saya post dan saya view. Jadi, saya hanya bisa ngepost , masukin , dan saya hanya bisa ngeliat. Saya gabisa hapus itu sehingga ada historical transaction nah semua dan selamanya akan ada disitu, dan itu berfungsi ketika kita mau ngetrack, nah itu berhubungan financial apalah itu. Nah makanya kita lg ada project integrasi itu namanya wallex, wallex itu mereka lg integrasikan pake blockchain.
I	Problem apa di financial industry yang paling bagus untuk ditackle oleh blockchain?
P	Banyak sih, contohnya record dari crowdfunding, bisa aja si platform ini bilang kalo “oh dananya belum sempurna nih, belum terkumpul lengkap” padahal sebenarnya mungkin aja udah, knp? Karena bisa aja dimanipulasi. Tapi kalo pake blockchain maka gaakan mungkin bisa karena recordnya udah jelas. Itu yang penting karena kan ledger kan yang berarti buku besar.
I	Sebenarnya apakah penggunaan blockchain ini merugikan ga untuk financial service?
P	Kalo bank seharusnya nggak, mereka ga dirugikan. Memang sih ada beberapa pihak yang kemudian mereka berpikir ulang untuk menggunakan teknologi blockchain karena ya ini akan gampang ditrack sehingga gabisa memanipulasi lagi.
I	Apa yang membuat blockchain tepat untuk diterapkan di Indonesia?
P	Karena pemerintahan kita bobrok, nggak sih bukan itu jawabannya haha. Sebenarnya bukan indonesianya, tetapi di industry. Seperti yang tadi saya bilang, kita selama ini sudah berpikir kalau kita sudah efektif. Kita bisa buat ini lebih efektif lagi dengan blockchain ini.
I	Tapi kalau menurut kakak apakah masyarakat Indonesia sudah aware bahwa blockchain ini penting?
P	Sebenarnya itu ga penting sih, sebenarnya orang gabutuh tau sih. Misalnya nih saya pake gojek, terus kemudian kamu pake gojek yang decentralized. Ini sama nih chatnya kita mesen makanannya. Misal kamu bayar 9500 sedangkan saya bayar 8000. Kamu tau gak kalo kamu pake gojek yang decentralized? Misalnya nih, nggak kan. Karena user gaperlu tau. Tapi processing datanya ini lah yang berbeda.

	Balik lagi ke pertanyaan tadi, gimana cara adopsinya? Sebenarnya user gaperlu tau, yang mereka perlu tau adalah mereka perlu tau gimana cara mendapatkan benefit dari teknologi ini.
I	Kalau dr perusahaan sendiri untuk mengembangkan blockchain di perusahaan intentionnya positif ya?
P	Harus, jadi lebih positif
I	Challenge utama dari adopsi blockchain di perusahaan itu apa sih Kak?
P	Banyak blockchain project yang mereka itu memanfaatkan momentum di awal-awal. Jadi banyak project yg misalnya nih saya bikin project gajelas kemudian saya raise fund, saya dpt duit banyak kemudian saya hilang. Kemudian apa? Imagenya jadi buruk. Terus kemudian orang bilang “iya itu kan yang blockchain2an atau itu yang crypto2an”. Nah jadi itu yang kita jaga betul lah.
I	Kalau secara technological characteristic, apa sih kak yang meningkatkan influence untuk menggunakan blockchain di perusahaan?
P	Saya merasa bahwa ini adalah teknologi yang inovasi yang kemudian ini sifatnya trustless, immutable, transparent, auditable. Bagi saya gaada alasan. Gini, kalo misalkansaya ngembangin sebuah platform atau system yang baru pasti saya mau kalo system saya ini aman, iya kan? Terus kemudian saya ingin system saya cepat dan stabil. Ya jawabannya ya blockchain lah. Wah saya udah jualan blockchain banget belum? Haha
I	Kalo secara kompleksitas itu blockchain sulit untuk dimengerti dan digunakan?
P	Tergantung untuk siapa, menurut saya sih nggak. Itu sangat mudah, applicable, sifatnya itu kaya. Semua itu akan terblockchain pada saatnya. Ini ibaratnya kaya internet di tahun 90an dan akhirnya adopsinya gila-gilaan.
I	Apakah blockchain itu relevan dan kompatibel dengan current needs dan infrastructure dari perusahaan?
P	Mungkin sekarang belum, karena gini memang ga semuanya blockchain2an lah. Untuk apa sebuah system yg sebenarnya udah berjalan running dan pake blockchain malah makin lama. Tetapi memang ada beberapa part dari industri yang sebenarnya bisa pake blockchain itu tadi. Jadi, gak juga gitu
I	Untuk di applynya itu sulit gak?
P	Kalo menurut developer ya pasti mereka harus belajar lagi. Tapi so far sih yang saya tau ya ga terlalu susah lah
I	Apa peran dari organization dalam mengadopt blockchain?
P	Mereka bisa mencoba untuk lini terkecil dari system yang mereka punya. Maksudnya gini, mungkin mereka gausah mengganti keseluruhan platform mereka untuk memakai blockchain. Tapi mereka, bisa mencoba bagian kan gini. Kan banyak bagian bisnis itu kan banyak, nah ada beberapa bagian dalam suatu kesatuan system lah, dalam system itu kan ada yang kecil kan. Kenapa gak coba dulu yang part kecilnya ini apakah efektif atau nggak. Kalau emang part ini efektif kenapa gak coba untuk apply blockchain ini.
I	Kalau dari human resource, infrastructure dan financial readiness itu apakah mempengaruhi dalam adopsi blockchain?
P	Bagi saya penting karena itu tadi 4 pillar, yaitu immutable, transparent, secure, dan auditable
I	Kalau peran top management support apakah memengaruhi dalam adopsi blockchain?
P	Oh penting karena justru mereka yang decision makernya karena kalo misalnya mereka say no ya no akhirnya. Tetapi kalo mereka memang coba, contoh ya, sucofindo. Saya juga cukup kaget saat mereka bilang mereka akan implementasi gitu ya, itu ya kaya menarik gitu. Otomatis berarti leader mereka udah aware dengan teknologi ini. Gausah jauh2 lah, kaya misalnya Jokowi nih, dia jg aware dengan teknologi ini. Bahkan yang mention dari pak haji ma'ruf amin. Maksud saya adalah pada level diatas aja mereka udah aware gitu tentang teknologi ini dan smg yg dibawah jg akan ngikutin
I	Kalau organizational size apakah memengaruhi dalam adopsi blockchain?
P	Sifatnya ini kalau memang sekali digunakan misal kaya smart contract itu sebenarnya akan gampang2 aja sih, gaada pengaruh skala besar atau kecil itu sama2 aja.
I	Kalau secara business environmental context bagaimana pengaruhnya dalam adopsi blockchain?
P	Oke, sebagian orang masih nge hidden bahwa ada perusahaan yang pake blockchain karena mereka itu masih kaya “ngapain sih lo sok2an pake blockchain”. Jadi ada beberapa company yang kemudian mereka kaya menutup diri, padahal mereka udah explore nih, malu-malu. Jadi ya menurut saya ini kaya tunggu2an nih. Kalo ada perusahaan besar nih menurut saya yg make blockchain maka pasti yang lain juga akan ngikut.
I	Kalau dari regulation apakah berpengaruh terhadap adopsi blockchain di perusahaan?

P	Regulasi itu kan lebih ke arah produknya ya dimana hasilnya adalah kriptonya. Tetapi, sebagai teknologi government gabisa ngapa-ngapain. Ini kan perkembangan jaman, perkembangan teknologi yg gaaada yg bisa menghalangi. Jadi jawaban saya adalah sampai dititik dimana pemerintah kita aware terhadap penggunaan blockchain ini leboh berguna pada aspek2 tertentu dan kategori2 tertentu. Misalnya gini, fintech itu kan diaudit oleh OJK, kalau misalnya fintech ini platformnya gabenar, maka pasti ojk akan protesnya kan. Jadi menurut saya, ada ngaruhnya peran pemerintah cuma memang tidak terlalu signifikan
I	Berarti apakah pemerintah Indonesia mendukung?
P	Oh pasti , Indonesia mendukung kok
I	Kalau dari market dynamic kaya competitor, market itu ngaruh?
P	Banget2, ya balik lagi semoga jangan ada yang nakal-nakal lagi lah. Udah banyak kejadiannya duit yg bawa kabur di Indonesia, sedih lah
I	Kalau secara Teknologi, peran organization maupun external itu mana yang paling penitng dalma mengadopt blockchain?
P	Environment itu paling penting. Karena itu tadi kalau environmentnya ga mendukung untuk pakai blockchain, kenapa pakai blockchain? Tapi kalo misal environmentnya kaya “oke pake blockchain” ya jalan
I	Kalau banyak yang merasa consumer belum ready dan market Indonesia belum ready itu apakah pengaruh juga?
P	Justru sebenarnya yg perlu disiapkan adalah dari sisi perusahaannya. Memangnya consumer perlu tau kalo dia pake blockchain atau nggak? Yang penting mereka perlu tau benefitnya.
I	Kalau di indo apa udh ada project yg berhasil?
P	Hmm hard to say, ada yg udah saya handle juga, data monetization, ini gmn caranya blockchain bisa ngembalikan kepemilikan data owner. Yang saya tau ada yang udah running tapi masih struggling lah (HARA).
I	Kalau ada yang bilang bahwa blockchain itu teknologi yang belum mature, apakah benar?
P	Teknologi ini kalau saya bilang masih premature, mending kalo udah jadi, saya bilang ini masih premature atau belum jadi. Karena apa? Pertama, teknologi ini masih banyak dilakukan process update. Yg kedua, dia sebenarnya masih belum menemukan jati dirinya sih. Masih belum stabil kemudian dr segi utilitynya masih bingung nih mau dibawa kmn. Kemudian masih banyak variannya yg istilahnya membingungkan. Istilahnya org masih uji coba lah, masih test drive.
I	Kalau tidak semua bidang bisa di blockchainkan apakah benar?
P	Iya, misalnya dalam suatu perusahaan A , B , bisa blockchain. Intinya gini ya, setiap lini perusahaan maupun kehidupan manusia itu pasti ada pencatatan ya. Nah pencatatan ini bisa pake blockchain, persoalannya adalah mau atau tidak. Dari komunitas bahkan berpikir bahwa sector kesehatan adalah yang paling terakhir dalam mengaplikasikan blockchain. Ada kenapa, krn kesehatan ini kan agak punya resiko ya. Mereka harus zero mistake. Jadi bener2 gaboleh ada kesalahan sama sekali. Biasanya kalo ada kesalahan itu harus dihapus, tapi kalo diblockchain itu gabisa dihapus. Jadi kaya, malpraktik gampang bisa diakses. Jadi kalo ditanya bisa apa nggak ya gagitu sih sebenarnya mau atau nggak aja.
I	Kapasitas terbatas?
P	Saya ga ngerti, itu unlimited ya. Mungkin maksudnya size dr blocknya ya, soalnya unlimited, jadi menurut saya lebih ke arah sizenya sih.

Participant 10

Position: Chief Technology Officer
 Financial service type: Peer to Peer Lending
 Adoption type: Adopter

I	Jadi produk dan service apa saja yang ada di perusahaan?
P	Jadi perusahaan itu.. kamu tau peer to peer lending kan ya? Peer to peer lending di Indonesia itu ada 133 sekarang kan udah ada banyak banget tuh dan itu semuanya pada berantem semua. Padahal yg namanya peer to peer lending itu punya kerentanan untuk di salah gunakan either orang2 yang tidak bertanggung jawab maupun orang2 yang kepepet. Jadi kaya kalo googling kaya ada supir yang bunuh diri gara2 gabisa bayar peer to peer lendingnya. Itu karena dia minjem dari satu perusahaan dan untuk ngebayarnya dia pinjem dari perusahaan lain lagi dan kalo di banking itu namanya overfinancing dan itu masalah besar sekali dan lama kelamaan jadinya dgn jumlah p2p yang ada 133 dgn database yg central, gaada yg tau datanya dan akhirnya menjadi masalah besar sekali nah perusahaan kami melihat masalah itu. Lalu kemudian ada masalah kedua yaitu UMKM di Indonesia suka tidak terdani dan susah mendapatkan akses ke bank padahal di Indonesia itu 60% GDPnya dari UMKM jadi besar sekali, lebih besar dari sector yang lain. Kenapa mereka gabisa mendapat pendanaan? Itu karena mereka ga mengerti tentang finance dan rada buta finance. Anyway itu dua hal. Nah itu kita mikir gimana caranya kita bisa bridging keduanya. yang kita buat di perusahaan kami itu adalah data platform antara satu sisi ke sisi lainnya, yaitu UMKM dan peer to peer lending. Kita gamau jadi peer to peer lending tapi, kita maunya supaya banyak peer to peer lending kerjasama sama kita. Justru kita jadi toolsnya mereka. Nah kalo udah ada itu yang jadi isuenya adalah kepercayaan. Karena ga semua p2p mau kerjasama, kaya ngapain gue taro di server orang lain. Nah itu, blockchain mainnya disitu. Jadi nanti masing2 pihak, masing2 p2p lending itu akan bisa punya node blockchain atau blockchain server sendiri lah. Jadinya karena terdistribusi, mereka tidak akan ada perubahan data karena dia megang datanya juga sendiri. Jadi itu sih latar belakangnya, blockchain digunakan untuk itu.
I	Keuntungan menggunakan blockchain pada bagian tersebut apa?
P	Keuntungannya kaya kalo misalnya kita bandingin gampangnya dengan database centralized biasa. Kalo database yang tercentral, adminnya bisa ngerubah data. Misalnya kita bikin perusahaan jadi centralized database, ya saya sendiri sebagai CTO nya bisa merubah data-data yang masuk. Sedangkan kalau pake blockchain, ada data masuk, saya pun gabisa merubah datanya.
I	Apakah mbak punya ekspektasi penggunaan blockchain lainnya tidak di perusahaan?
P	Well kalo sekarang ini masih untuk namanya anti tampering supaya gaada perubahan data. Tapi untuk kedepannya, kami kepikiran untuk dibikin fully pseudonymous dimana bahkan perusahaan sendiri sebagai platform gabisa ngeliat datanya. Jadi kita gak tau datanya gimana diatas platform kita, tapi kita tau datanya itu bener, asli, dari umkm. Itu yg selanjutnya, tapi untuk itu tentunya regulasi akan membingungkan. Kalau diaudit terus kita gatau datanya apaan kan nanti dipertanyakan kan. At the same time kan itu jadinya orang akan lebih percaya sama kami karena data orang gak kita simpen.
I	Cara kerja perusahaan secara sederhana?
P	Untuk perusahaan, jujur kalo sekarang ini itu masih kita sama partner2 kita jadi ga terlalu luas lah. Tapi nantinya misalnya peer to peer lending yang udah kerjasama full sama kita, dia bisa ambil satu node blockchain. Jadi pertama dia gabung sebagai konsortiumnya kita. Di dalam satu consortium itu dia pegang satu servernya sendiri, nodenya nanti dia bisa nyalin dan ngejagain datanya, dimana yg punya dia ya punya dia. Dan itu hanya bisa diubah, well gabisa diubah sih, masing2 pihak yang bekerjasama akan megang 1 node sendiri.
I	Itu pake consortium blockchain ya berarti? Kelebihannya apa?
P	Sebenarnya nih, itu kan cocok2an. Kalo untuk kasus ini sangat cocok, karena ini perbandingannya kan kalo kaya private public, di dalam private subsetnya ada consortium kan. Pertama knp kita private? Karena ini financial data. Kalo kita taro di public, sebenarnya masih ada perdebatan mengenai apakah cryptographic data itu boleh keluar dari negara ini. Kalo misalkan di encrypted, jadi inget kan kalo ada yg namanya prinsip kedaulatan data yang ada di kominfo, gaboleh naro data yg berhubungan dengan financial atau natural resource. Kita kan data finansial berarti kan

	gaboleh ditaro di luar, kalo ditaro di luar negara langsung kena tuh kita. Nah kalo dengan public blockchain, sebenarnya kita bisa melakukan encryption atau hashing kita taro disitu. Itu sekarang masih banyak yang bertanya apakah sebenarnya itu data keluar negara atau nggak. Itu yang masih jd pertanyaan dan alasan kenapa kita pakenya private blockchain. Tapi jujur untuk testing kita banyak pake public blockchain juga. Untuk testing ya, krn untuk testing pake public blockchain itu murah banget. Kadang kalo kamu liat, ngembangin pake public blockchain itu selalu ada yang namanya test net. Oke jadi, kalo di public blockchain itu ada main net dimana main net itu kaya ethereum gitu untuk pasang aplikasi dmn kita harus bayar ethereum untuk bisa jalan. Tapi kalo untuk test net, gaperlu bayar. Dan itu banyak yg public, bukan cuma ethereum tp yg lain jg. Jadi untuk kita melakukan development, kita bisa punya versi public blockchainnya dan kita deploynya di private blockchain.
I	Kalau di financial service, problem apa sih yg paling bagus untuk ditackle oleh blockchain?
P	Oke aku liatnya kalo untuk sekarang itu adalah untuk KYC. Jadi kalo KYC itu kan masalah data dan data itu kan banyak sekali, ada banyak sekali big data. Ada revolusi big data kemarin itu justru membuat orang sangat jealous terhadap datanya. Jadi gue gamau sharing data ke orang lain karena data ini berharga. Padahal yang namanya big data itu lebih berguna kalo datasetnya besar. Makanya blockchain itu bagus untuk beberapa pihak sharing data dengan baik dan itu bener2 secara unik untuk itu, kalau di banking itu. Orang semua bilang “oh mungkin payment ya atau remittance” nah bener kedua itu bisa. Tapi satu payment susah di regulasi, kalo remittance bisa tapi harus dipikirkan kalo blockchain itu hanya satu bagian, nah itu cuma teknologinya aja. Money fullnya harus dipikirkan juga. Nah lucunya kalo dipayment, misalkan saya punya bitcoin nih tinggal scan QR code aja untuk kirim2an dan itu udah bisa dari tahun 2011.
I	Kalo blockchain prosesnya lebih lama itu gimana ya?
P	Nah, ini sebenarnya cuma dari logika aja sih, krn kan.. hmm aku kan orang lama ya, aku dari dulu udh megang blockchain. Jadi sekarang itu udah dipisah ya antara blockchain sama DLT yg lain. Basenya blockchain itu namanya Distributed Ledger Technology (DLT), dan DLT itu skrg dibagi menjadi 2 yaitu Blockchain dan DAG (Directed Acyclic Graph). Jadi, kalo misalnya ini kan perbedaan sifat arsitektur. Kalo misalkan kamu ngeliat arsitektur yang biasa, itu ada satu central server terus abis itu ada banyak line/ client. (14.22) , kenapa bisa dibilang dia lebih cepet drpd blockchain? Karena dia datanya ada di satu tempat. Sedangkan kita mau buat jenis lain, misalkan ring topology, kalo ring topology datanya sekilas kaya blockchain, tapi nggak sebenarnya karena datanya terpisah pisah, ada data di sini lalu di sana, jadi semuanya ga kebagian data yang sama jadi mungkin datanya bisa overlap, tapi dia bisa lebih cepat dari blockchain karena dia gaperlu copy semua data ke semua tempat. Kalo misalnya kita bikinnya blockchain, semua data dan semua node ada di semua tempat. Dan kalo misalnya mau ngeconfirm suatu kejadian, semua pihak harus ngeconfirm kalo ini bener (misalkan A bilang bener , B bener, C bener dan D bener) tapi kalo D bilang ga bener alhasil, ada pertanyaan dan transaksi itu jadinya gavalid. Sedangkan DAG, yg dilakukan adalah (A confirm, B confirm, C confirm, tp D ga confirm) jadi misalkan ada syaratnya beberapa konfirmasi itu udah dianggap confirm walaupun belum semuanya. Jadi DAG akan lebih cepat daripada blockchain , blockchain akan selalu lebih pelan daripada centralized system. Tapi. Jaman skrg kita gamasukin semua data di dalam blockchain. Jadi gini, misal kita bikin sebuah solusi misalnya kaya video youtube. Ini kalo misalkan kita masukin ke centralized server gampang lah ya, tapi kalo ini kita masukin ke dalam blockchain dia lama karena harus mengcopy diri sebanyak tempat. Yang bisa dilakukan untuk video kaya youtube adalah videonya tetep centralized tapi log dari videonya , alamat file dari videonya atau hash dari videonya , jadi cryptographic code dari videonya itu yang dimasukkan ke blockchain. Jadi ada yg jenis biasanya yg lebih cepat dan ada jenis blockchainnya yang lebih pelan tapi lebih akurat. Jadi penggunaan blockchain itu tidak full semuanya, gara-gara gitu krn kalo full semuanya di blockchain it always going to be a bad idea kecuali datanya memang data minor data structured data kecil.
I	Jadi DLT sama blockchain itu beda?
P	Jadi aku tetep ngerasa semuanya blockchain tapi dibagi 2 yaitu blockchain dan DAG. Intinya keduanya tetep berhubungan dengan sebuah ledger yang terdistribusi, tapi ada yg terdistribusi semuanya atau sebagian2 dulu. Jadi kalo di blockchain musyawarah mufakat, kalo DAG anggap aja suatu negara terus misal desa udah confirm, kecamatan udh confirm terus atasnya udah bisa gerak. Jadi ada local consensus (DAG) dan global consensus (blockchain). Kalo kaya untuk IT itu pake DAG
I	Apa yang membuat blockchain tepat untuk diterapkan di Indonesia?

P	Indonesia jg decentralized haha intinya sih gitu. Kalo aku ngeliatnya Indonesia gt, kalo km udah mulai kerja dan ada hubungannya sama IT itu bakal sering banget ketemu suatu suatu proyek yg namanya system integration sampe ada banyak sekali banyak perusahaan yang melakukan yang namanya SI. Karena di Indonesia pihaknya banyak sekali bahkan satu pemerintah kita yg besar sekali itu kan terfragmentasi karena ada namanya otonomi daerah. Gampangnya kalo kamu liat, jaman dulu pertama ada hp, ada banyak sekali provider. Tapi skrg provider kita jg banyak banget kan dan mereka saling bersaing terus ada standar pulsa yang berbeda beda kan dan payment juga. Yang lebih parah sekarang, payment juga banyak banget kana da gopay, ovo, linkaja, cashbac, semuanya banyak sekali kan. Itu memang pemerintah sedang mencoba untuk centralisasi dari semuanya makanya blockchain itu cocok karena misalkan kita menggabungkan QR payment itu di dalam suatu system pake blockchain itu kita gaperlu ada central server. Masing-masing pihak gopay, ovo itu punya server sendiri tapi bisa nyambung sama yang lain. Jadi satu QR code bisa untuk macem2. Bayangkan kalau itu bukan cuma payment aja, tapi untuk dokumen juga, misalkan untuk ngurus nikah, dll hrs bolak balik ke kecamatan lah kemana lah dan sebenarnya itu kan menjadi suatu masalah, kalo kita pribadi ya kita jadi kesel sendiri. Bayangkan kalau untuk bisnis, gaenak banget kita ribet. Aku ngurusin surat perusahaan bisa berbulan
I	Aside dr financial apa lagi ya kegunaan blockchain?
P	KYC itu bukan cuma untuk financial ya, kyc bisa untuk sosial media dan segala macem. Blockchain itu cocok banget dengan sebenarnya yang berhubungan dengan dokumen2 legal. Dokumen pertanahan kita kan berantakan banget, nah itu bisa, terus notaris, letter of credit itu juga bisa
I	Berarti bisnis yang berpeluang itu yang punya banyak dokumen2nya yaa?
P	Dokumen2, KYC kan juga sebenarnya dokumen ya, bisa dibilang sih yang berhubungan dengan dokumen-dokumen gitu dan yang berhubungan dengan banyak pihak yang megang dokumen tersebut
I	Berarti blockchain ga tepat untuk bisnis yang kaya gimana?
P	Ga tepat di Indonesia untuk payment, buat di Indonesia ya, buat di luar negeri cocok. Di Indonesia ga cocok karena .. itu juga akan jadi diskusi tuh karena Libra kan dipake buat payment ya tapi gampangnya yg ga cocok adalah kalo ada satu tmpt nyoba implement blockchain tapi organisasi itu adalah organisasi yang dimiliki sama diri sendiri, istilahnya dia gaperlu partnership, istilahnya semua udah running sendiri, ngapain pake blockchain.
I	Obstacle dan challenge dalam adopting blockchain?
P	Obstacle paling utama sih yang non teknisnya karena kita harus menggabungkan.. kita ambil contohnya yang consortium ya kita harus ngegabungin orang dalam consortiumnya itu tidak mudah, bukan teknologinya yang sulit, teknologinya gampang, tapi untuk saling percayanya itu yang sulit sampe mereka mau kerjasama itu kita harus bikin FGD dll
I	Apakah masyarakat dan consumer di Indonesia ini sudah ready dgn implementasi blockchain?
P	Masyarakat di Indonesia itu dr beberapa tahun ngerjain ini, sejak 2 thn yang lalu udah jauh lebih siap. Tapi apakah udah siap sekali? Honestly belum. Saya sering sekali ngerjain proyek untuk perusahaan2 di Indonesia dan akhirnya jadi POC atau MVP, tapi abis itu gak kedengeran lagi, padahal bisa jadi besar sekali.
I	Kalo market demand?
P	Kalo market demand blockchain consulting udah banyak banget, kalo blockchain product ya sedeng, ya gini kalo pertanyaannya adalah dalam 123 tahun kedepan blockchain itu akan laku apanya? Yang laku masih consultingnya Plus yang laku adalah yang non-enterprise. Jadi kalo enterprise kan kaya banking tapi kalo non enterprise itu kaya startup terus orang bikin service iseng2 banyak banget tuh. Dan org Indonesia bukan kaya hal2 yg ga penting bisa jg yg keren banget tp belom enterprise. Enterprise itu masalahnya bukan karena blockchain gabisa enterprise grade, tapi justru karena enterprise itu masih bingung mengapply business value blockchain itu ke enterprise mereka karena mereka harus percaya ke banyak pihak yg keluar2 dimana perusahaan kan ga seperti itu
I	Masa depan blockchain itu gmn?
P	Menurut saya butuh 5 tahun untuk bisa sampai di enterprise2. Unfortunately bakal kaya gitu. Aku kira bakalan cepat, skrg kalo diliat orang cuma nyoba2 doang.
I	Maturity?
P	Teknologi itu akan selalu berkembang dan kalo teknologi kaya blockchain karena teknologinya itu bukan cuma satu. Kalo aku bilang udah mature ya udah, tapi apakah semuanya udah mature?

	Belum , karena kita ada blockchain yg dikembangkan oleh Indonesia yaitu vexanium, apakah sudah mature? Saya belom bisa bilang ini sudah mature karena baru. Tp blockchainnya sendiri sebagai filosofi ini udh mature,
I	Kekurangan?
P	Semua teknologi ada kekurangan, kalo gak cocok di applynya ya lebih mahal. Kaya tadi, kalo ga cocok di applynya lebih lamban. Harus ada kesepakatan juga, kalo emg gabutuh jangan pake karena jd gak cocok
I	Technological?
P	Kemampuan untuk mendistribusikan kepercayaan antara pihak-pihak yang ga saling percaya, contohnya tadi yaitu peer to peer lending, orang gabisa saling percaya karena mereka compete kan , karena mereka bisa saling percaya diatas teknologi itu, kalo saya menyebutnya trust engineering , it's not a formal term , tapi trust engineering itu penting dengan blockchain
I	Apakah blockchain sulit untuk diimplementasi?
P	Kalo aku sendiri ya ga sulit tapi beberapa kali aku bikin event itu sulit banget untuk bikin orang mengerti harus berkali2, I guess it's harder than I thought.
I	Apakah kompleksitas mempengaruhi?
P	Menurut aku gampang tp krn aku hidupnya disitu, tp kalo knp di Indonesia itu masih masalah dalam mengapply blockchain itu aku rasa krn orang2 ngerasa terlalu kompleks ya dan pr kita sebagai komunitas untuk menjelaskan ke orang2 sampe orang ngerti.
I	Untuk pengedukasiannya sendiri apakah sulit>
P	Edukasi orang itu selalu sulit dan belum ada yang ngajarin blockchain
I	Apakah mbak melihat blockchain itu relevan dan kompatibel dgn current needs dan infrastructure dr perusahaan? Pengaruh kah?
P	Jadi business model kita gaakan jalan tanpa blockchain jadi ya sangat kompatibel
I	Apa peran dari perusahaan sbg organization sbg intention
P	Gini perusahaan harus terbuka untuk bekerja sama dengan yang lain atau di dalam perusahaan sendiri setiap divisi harus terbuka untuk saling bekerjasama satu sama lain. Jadi itu yang akan mengenable blockchain, jadi culturally secara perusahaan emang harus siap untuk memakai ini. In the future is collaboration. Sekarang ini negara2 yg udah maju, kita satu toko ke toko lain itu banyak yg terjadi. Nah gampangnya kalo di singapur misalkan aku sakit terus aku xray di rumah sakit A terus pindah ke B , xray aku akan muncul disana. Tapi di Indonesia gak gitu, itu yang sebenarnya Indonesia siap untuk melakukan itu, ketika udah siap justru itu yang akan memperkuat untuk implementasi dan posisi blockchain. Jadi ketika kita ketemu perusahaan di Indonesia itu mereka udah pada happy2, tapi ketika udah sampai atas justru mereka yang gamau untuk kerjasama.
I	Kalo FMCG gmn?
P	Wah ini seru nih, jadi kalo di FMCG kita bisa ambil contoh perusahaan juga which is ini kita sync productionnya krn kita ambil data di UMKM juga kaya warung, org2 jualan pasar itukan ada data SKU ya (stock k unitnya) yang kaya odol pepsodent brp harganya segala macem, itu sebenarnya data FMCG yang sebenarnya bisa dipake FMCG juga jadi kasus ini banyak terjadi sebenarnya dan bisa dibantu blockchain juga. Beberapa pihak kaya Carrefour dll gamau sharing data karena itu data saya , jadi ada beberapa data brokerage kaya gartner, dll sebagai middlemannya. Tapi blockchain itu justru bisa ngilangin middlemannya tersebut. Nah itu FMCG jadi kuat datanya krn itu dan mereka akhirnya bisa tau sebuah customer juga gara2 itu jadi kalo skrg kita mau tau misal average person living in cilandak itu belanjanya dimana aja dan rata2 apa kita mungkin bisa tau untuk Carrefour doang. Penyetaraan kepercayaan data itu kunci supaya FMCG bisa dapet data lebih luas.
I	Tapi kalo FMCG udh ada yg make?
P	Belum sih tapi kalo downstream sedikit kaya Walmart itu udah. Kalo FMCGnya belum. Kalo Walmart itu untuk data dan supply chain itu private atau consortium.
I	Kalo di perusahaan sendiri, kaya human resource, financial readiness, infrastructure itu penting>?
P	Sangat penting karena ada 2 bagian ya, HR knp penting? Karena resource harus ngerti. Leadership harus ngerti business valuenya apa dan kalo secara keuangan ya sebenarnya harus siap. Gmn juga kalo implementing technology itu harus siap secara uang. Bukan cuma blockchain, tp implementing data jg sama

I	Kalo top management support?
P	Harus dari top management karena kalau dari bawah malah susah. Aku ngeliatnya justru karena blockchain itu strategis banget dia harus dari top management dan harus dari segi partnership dia mau partneran dengan siapa. Kalo dia punya banyak partner dan dia ngerasa harus pake blockchain itu bagus.
I	Size organization?
P	Aku bilang ga penting karena banyak juga yang organizationnya kecil2 tapi usernya banyak misalnya atau pihaknya banyak atau banyak yang kerjasama sama mereka lah. Jadi ga penting ukurannya. You don't need to be a huge company, you can be a really small company to implement blockchain. Tapi emang harus pas, pasnya dimana? Ya itu yang tadi aku bilang dari environment, kalo environment kita tidak saling percaya jadinya kalo kita pake blockchain untuk saling percaya justru itu jadi good business value untuk mereka.
I	Regulation?
P	Ga pengaruh sih kalo secara teknologi tapi karena kita pegang financial data nah itu yang pengaruh di big data , kalo teknologi blockchainnya sih masih belum pengaruh karena kita kan make blockchain untuk jagain data, jadi masuknya ke security, masuk ranah OJK karena kita fintech
I	Kalo dari pemerintah sendiri apakah mendukung?
P	Ya mendukung karena di PP OJK 77 thn ini kalo gasalah atau tahun lalu tentang inovasi keuangan digital, di butir penjelasannya ada yg menyebutkan blockchain jg jadi kan jelas ada disitu. Udah banyak tapi jangan nyebut yg crypto ya krn beda , udah disebut dan mereka sangat aware.
I	Market dynamic?
P	Ngaruh ya krn namanya teknologi baru kan ada hypenya, memang akhirnya banyak diluar sana yang menggunakan blockchain hanya untuk hypenya saja dan itu banyak yg jadi kompetitor2 kita jujur. Kalo kita make blockchain bener2 secara terbatas bukan karena apa-apa karena kita ngerasa yang lebih cocok di Indonesia ya seperti ini. Kalo yang lain diluar sana banyak yang pake blockchain karena mikir "oh sexy nih" bisa pake nih, kita gamau kaya gini. Kalo mereka nih dalam tanda kutip "lebay" dipake berlebihan akhirnya ga cocok istilahnya youtube dipakein blockchain gitu.
I	Kalau dari semua factor apa yang paling penting?
P	Aku rasa sih design di awalnya, business modelnya sesuai atau nggak. Itu paling penting
I	Kalo perusahaan apakah d'app?
P	Bukan, actually it's good that you ask whether it's d'app or not. oke kalo d'app itu kan misal ini blockchain terus bener2 kaya kamu punya browser apa ini kaya self contain dia log in sendiri dan dia running sendiri, dan datanya itu tidak tersimpan di satu tempat tapi di banyak node bahkan ada tipe2 d'app yang datanya ada di sini dan di sini, dan d'app yang sekarang banyak yg pake ethereum itu instead nembak ke server itu dia nembak ke blockchain, log in nya jg berubah karena dia bukan pake username password pair tapi dia pakai private key public key pair which is itu disimpan disini dan gapernah keluar. Nah ini kan d'app ga kaya gitu. Kalo perusahaan itu ada database biasa terus ada aplikasi biasa terus ditembak ke database biasa. Tapi di dalam database ini, semua data yang masuk diamankan atau di hash , hash tersebut dimasukkan ke dalam blockchain, tapi datanyatetep dimasukkan ke sini juga. Jadi bentuknya kaya aplikasi biasa. Nah ini penting karena kalo pake d'app biasa, OJK bisa marah karena ini data finansial tapi ditembak ke public blockchain. Sedangkan kalo kita nyimpen data finansialnya disini, memang ada hashing dimasukkan ke dalam blockchain tapi data yg ada disini itu basically private blockchain. Kalupun kita pake public blockchain juga ini hash dari data bukan data sendiri jadi gapapa
I	Apakah decentralized selalu lebih baik dr centralized?
P	Nggak jangan dianggap kalo itu selalu lebih baik.
I	Kelebihan centralized
P	Lebih cepet, inget gak jaman kita sma atau smp kan ada ketua kelas tuh. Lebih cepet mana milih warna kaos kelas sama ketua kelas atau musyawarah? Ketua kelas kan. Itu sentralised kalo misalkan kita musyawarah mufakat itu ya blockchain
I	Blockchain itu kan gabisa diapus ya? Kalo ada kesalahan gmn ya
P	Oke jadi itu bisa diubah tapi datanya tetep ada, jadi dibilang data yg dulu berubah jadi yg baru ya. Jadi lebih teraudit
I	Kapasitas terbatas?
P	Tergantung sizing bikinnya gmn

APPENDIX II CASE STUDY PROTOCOL

Objective of the research

The main aim of this research is to investigate the factors that influence the financial services technology based companies in Indonesia to adopt blockchain technology

The key issues of the research are:

1. Identifying factors from TOE frameworks that influence participant on adopting blockchain technology on their company
2. Identifying the relation between each factors on TOE framework

The main research question is:

1. What technological, organizational and environmental factors influence Indonesia financial services company on adopting Blockchain technology?
2. How is the different context on technological, organizational and environmental influence each other on intention to adopt Blockchain technology?

Field note

The fieldwork of this research took place in Indonesia, specifically on Jakarta. The researcher obtained initial consent to meet people from financial service technology based company who are affiliated with blockchain technology and not affiliated based on Indonesia blockchain and cryptocurrency landscape 2019.

Interview guides

- The researcher will inform the interviewees of the time and date of the interviews.
- The researcher will start with a brief introduction to the participant
- The researcher will inform about TOE framework and each context definitions
- The researcher will show participants the objectives of the research and explain that the data are being gathered only for scientific purposes.
- The researcher will use an audio-recorder and take written notes during the interview.
- The researcher will seek the permission of the informants to record the sessions. .
- At the end of each interview, the researcher will summarize the issues discussed and ask the informants to comment on what they have said, if that is possible.

Questions

- Adopter
 - What are the factors of Blockchain that effect your interest on using this Technology?
 - Why does your company use Blockchain? In what function do you utilize blockchain?
 - In what way does Blockchain benefited your company?
 - What is the technological characteristic of Blockchain that benefit your company?

- What do you think of organization role on adopting a new innovation, in this case to adopt Blockchain on your company?
- How long and what process does your company take when adopting blockchain?
- How do you think the business environmental context effect on the company decision to adopt Blockchain?
- Is there any obstacle or challenge when in the process of adopting blockchain technology?
- From the three context consists of Technological, Organisational and Environmental, what do you think is the most important factor to implement Blockchain as a new technology innovation? What is the priority?
- Non Adopter
 - Why does your company does not use Blockchain?
 - Have your company considered on adopting Blockchain technology?
 - Have your company already evaluate and do a planning towards blockchain implementation?
 - What are the factors of Blockchain that effect your interest on using this Technology on the future as a new innovation?
 - What is the technological characteristic of Blockchain that you think would influence your company to adopt this technology?
 - What do you think of organization role on intention to adopt new innovation? in this case for adopting Blockchain technology in your company
 - How long and what process does your company take when adopting new technology innovation?
 - How do you think the business environmental context effect on the company intention to adopt Blockchain?
 - From the three context consists of Technological, Organisational and Environmental, what do you think is the most important factor to implement blockchain as a new technology innovation?

APPENDIX III

EMAIL TO THE PARTICIPANT

Introduction

Hello. My name is Nadya Aulia Vitriastuti, a final-year student of SBM ITB majoring in Management. Currently, I am conducting a research regarding "Identifying Influencing Factor for Intention to Adopt Blockchain Technology: In Perspective of Financial Services in Indonesia". Blockchain is considered as new and disruptive technologies. Meanwhile, the adoption rate on Indonesia is still niche. The phenomenon of emerging financial technology in Indonesia shows that financial service is potential for adopting a new technology innovation. On this study, I want to know financial service industry player on their factors for influencing adoption for Blockchain as a new technology innovation. I am investigating the applicability and adoption of Blockchain in the financial service. I do this on the basis of three aspects, namely the Technological aspects of Blockchain on financial service, the environmental aspects of the financial service and the specific Organizational aspects of the financial service. On this study I would like to understand and compare the perspective of adopter and non-adopter of Blockchain technology on their influencing factor to use Blockchain technology.

Opening Question

- Is there any new technology that being incorporated with your company? Ex AI, IOT, cloud computing?
- Have you heard about Blockchain before? If you know, what do you know about blockchain?
- Does your company already adopt Blockchain? (If adopt, to what extent Blockchain is used)
- How would you describe your knowledge about Blockchain?
- Do you have any expectations of Blockchain on your company or sector?
- What are the examples of Blockchain application that you familiar with?

Questions

- Question
 1. Adopter
 - What are the factors of Blockchain that effect your interest on using this Technology?
 - Why does your company use Blockchain? In what function do you utilize blockchain?
 - In what way does Blockchain benefited your company?
 - What is the technological characteristic of Blockchain that benefit your company?
 - What do you think of organization role on adopting a new innovation, in this case to adopt Blockchain on your company?
 - How long and what process does your company take when adopting blockchain?
 - How do you think the business environmental context effect on the company decision to adopt Blockchain?
 - Is there any obstacle or challenge when in the process of adopting blockchain technology?
 - From the three context consists of Technological, Organisational and Environmental, what do you think is the most important factor to implement Blockchain as a new technology innovation? What is the priority?
 2. Non Adopter
 - Why does your company does not use Blockchain?
 - Have your company considered on adopting Blockchain technology?
 - Have your company already evaluate and do a planning towards blockchain implementation?
 - What are the factors of Blockchain that effect your interest on using this Technology on the future as a new innovation?
 - What is the technological characteristic of Blockchain that you think would influence your company to adopt this technology?

- What do you think of organization role on intention to adopt new innovation? in this case for adopting Blockchain technology in your company
- How long and what process does your company take when adopting new technology innovation?
- How do you think the business environmental context effect on the company intention to adopt Blockchain?
- From the three context consists of Technological, Organisational and Environmental, what do you think is the most important factor to implement blockchain as a new technology innovation?

The data and information during the interview process will be treated confidentially and anonymous. If you are able to be interviewed, i would be very delighted. Thank you

Warm regards,

- Nadya Aulia Vitriastuti

The infographic, titled "Indonesia Blockchain & Cryptocurrency Landscape Version 1.0", is organized into six main categories, each represented by a colored circle and a list of logos:

- Service Provider** (Blue circle): Includes logos for Quickku, Opajak, Microsoft Azure, VEIRIS, and AWS.
- Government Bodies and Associations** (Green circle): Includes logos for ASOSIASI BLOKCHAIN INDONESIA, BAPPEBTI BANK INDONESIA, and KEMKOMINFO.
- Media and Information** (Yellow circle): Includes logos for Coinvestasi, COIN DAILY, and Blockchainmedia.
- Projects and Solutions** (Orange circle): Includes logos for PLAYGAME, PUNDI, HARA, lyfe, ZAMSASA, VENTANILAH, Tokoin, gictrade, kendi, Santora, SENARAI, and OneMe Identity.
- Exchanges and OTC** (Purple circle): Includes logos for coinone, Huobi Indonesia, Rekeningku, TOKENOMY, INDOCRX, LUNO, Tokocrypto, UDAX, BITOCTO, INUCEX, pintu, digitalexchange.id, UPbit, GOPAX, and KOINX.
- Mining** (Pink circle): Includes logos for UNICOIN and HONEST MINING.

Additional logos and text are present in the background, including "Community and Eco System" (Blockchain Space, ICS, CRYPTOWATCH, IBN, COIN FEST, Blockchain Indonesia, BLOCKCHAIN INNOVATION CENTER, BLOCKCHAIN INDONESIA, BLOCKCHAIN PUS), "Consulting and Development" (Blockchain, BLOCKTECH, STANDAR APMIS, BlackSphere), and "Active Protocol" (CARDANO, f(x), HYPERLEADER, wanchain, ethereum, nem, Achain, Aetosa).